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The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the Club was held on April 13, 1942. The President (Mr. P. Crosbie Morrison) presided and about 90 members and friends attended.

SUBJECT FOR THE EVENING

An illustrated lecture on "Seals and Eels" was given by Mr. F. Lewis, Chief Inspector of Fisheries and Game. A fine series of slides covering, firstly, the seals of Seal Rocks, Westernport, and secondly, the ascent of elvers up the Hopkins River falls, together with the explanatory matter, gave to the members a great deal of information on these two interesting animal groups.

Numerous questions were asked the lecturer, and various members commented on the subject. A vote of thanks to the lecturer was moved by Mr. A. H. Chisholm, who said that Mr. Lewis was the most efficient governmental officer of his kind in Australia. The motion was seconded by Mr. H. P. Dickins and carried with applause.

REPORTS OF EXCURSIONS

Mr. F. S. Colliver reported on the excursion to the Zoological Gardens, and stated that the two parties (senior and junior) totalled over 100.

ELECTION OF MEMBER

Mr. Arthur Crompton was elected an Ordinary Member.

GENERAL BUSINESS

Mr. R. G. Painter reported that in the Greensborough district there was an apple tree said to be 100 years old, it having been brought from Tasmania by John Batman. He asked that the Committee consider whether this tree would be deemed worthy of preservation and if so who would be the best authorities to approach.

NATURE NOTES

Mr. R. Lee reported having observed a Rufous Fantail at a Brighton garden for some hours recently.

Mr. V. H. Miller remarked on the scarcity of birds along the main roads since the heavy military traffic.

Mr. R. G. Painter reported that the beautiful cloud effects spoken of at the last meeting were due to a solar halo.

Mr. H. C. E. Stewart reported having closely observed a Crimson Rosella feeding another of its kind which was seen to have a damaged beak. (Mr. A. H. Chisholm commented that parrots seemed to have consideration for their mates to a greater degree than most other birds.)

Mr. Ros Garnet reported having noticed a parrot suddenly drop from a flock flying overhead; the bird when examined was seen to have been just killed and also to be heavily infested with parasites. He suggested that the bird was put out of its misery by the other birds of the flock.

EXHIBITS

Mrs. M. E. Freame.—Tooth of sea-lion and teeth of whales; tanned eel and shark skins; jelly-fish with young attached; anemones (grey, blue, white, lilac, and emerald-green).

Mr. J. Ros Garnet.—Orchids: *Pterostylis truncata* Fitz., cultivated from plants collected at South Belgrave in 1934 (locality not hitherto officially recorded); pot-grown specimens of *Pterostylis alveata* Garnet, cultivated from plants collected on Little Snake Island in 1939.

Mr. C. French.—*Blechnum* (*Lomaria*) *discolor*, var. *pinnatifida* (fishbone-fern), collected from near Drouin, Victoria.

Mr. A. H. Mattingley.—Sea-snake (*Hydrus platurus*) from the Great Barrier Reef.

Mr. P. Bibby.—Collection of Victorian lichens.

Mr. S. R. Mitchell.—Mineral specimens.

Mr. R. G. Painter.—Garden-grown native plants, including *Halgania cyanea, Goodenia geniculata, Brunonia australis, Correa Lawrenciana, Crotalaria laburnifolia, Epacris longifolia, Melaleuca laterita, Olearia lepidophylla, Thomasia petalocalyx, Calocephalus Brownii, Viola hederacea.*

NOVELTIES AT BALWYN

Five young ostriches from South Australia were added recently to the Wild Life Sanctuary at North Balwyn. Although devoid of stripes, except on the head and neck, they are not unlike young emus. These birds are believed to be the only young ostriches in Victoria.

Perhaps the most interesting—and beautiful—animals in the reserve are two pure white possums of the silver-grey species. The female has black eyes, but the male's eyes are pink. By the way, the owner of the sanctuary, Mr. W. R. Maughan, believes that white emus are at large somewhere in northern Victoria.

J. MOLLISON.

THE NUMBAT IN VICTORIA

By DAVID FLEAY, B.SC., Director, Sanctuary, Healesville

The Banded Ant-eater—an animal whose exact origin is shrouded in mystery, a living but passing relic of the earth's very early furred animals, a marsupial so different that it requires a special family name in zoological literature, and a probable Methuselah even among the kangaroos, possums and their kindred—this is the strikingly coloured, exquisitely dainty creature known to the aborigines as Numbat, and to the student of zoology as *Myrmecobius fasciatus*.

Yet one of these intriguing, ethereal little creatures, whose ancestors were specialized in remote times for their unusual mode of life, has lived to experience a one-day sky ride at 200 miles an hour right across Australia in man's swiftest and most modern form of transport, the aeroplane.

To be more explicit, on November 26th, 1941, the first living Numbat to travel by air was flown successfully by Australian National Airways from the Kojonup district of Western Australia to Victoria, and established in the Badger Creek Fauna Sanctuary at Healesville.

Formerly the Numbat had a fairly wide distribution, extending from the South Australian Murray lands and the west of Victoria right across to Western Australia; but, unfortunately, the South Australian animal (a distinct species) has gone for ever, leaving only the south-western corner of the continent as the last home of the little Westralian pointy-nosed *Myrmecobius*.

Less is known about the habits of the Numbat than of the majority of pouched animals, and that is saying a good deal. It was entirely with the idea of watching and recording its habits that the specimen brought to Healesville was obtained.

Thanks to the untiring enthusiasm of Miss Nita Kohlhagen, of Kojonup (W.A.) and to the co-operation and help of Mr. Fraser, Chief Guardian of Game, W.A., and Mr. Lewis, Chief Inspector of Fisheries and Game in Victoria, the long-sought Banded Ant-eater became a reality. It was captured near Kojonup on November 20, 1941, by Mr. J. C. Smith, six days before embarkation on its swift west-east continental crossing.

In the words of Professor F. Wood-Jones, the Numbat possesses the distinction of being so peculiar a creature that it cannot possibly be mistaken for any other species. Its body is about the size of that of a brown rat, the male being decidedly larger than the female, but the figure of the animal differs from that of most small mammals in the remarkable breadth and flatness of the hinder part. The region of the loin, instead of being arched in typical mammalian fashion, is flattened, much as it is in lizards. The comparatively thick and widely-spaced forelegs, combined with the pointed face seen in front view, are strongly reminiscent in miniature of the large ant-eating mammals of other countries.

Another of the many primitive anatomical features of the lovely little *Myrmecobius* is the absolute lack of any sign of a pouch. Its site is marked by specialized crimped hairs, and there are four teats to which "joeys" hang while they are growing.

Though superficially squirrel-like, particularly in the light airy way it scampers about, with its fuzzed-out tail held erect or arched over its back, *Myrmecobius* really bears a closer resemblance to that fellow-marsupial and fierce little raider of the gum trees, the Brush-tailed Phascogale. This is interesting in view of the fact that it has recently been considered that our remarkable little Ant-eater may possibly be an off-shoot of the family of insectivorous and carnivorous pouched animals to which the Phascogale belongs.

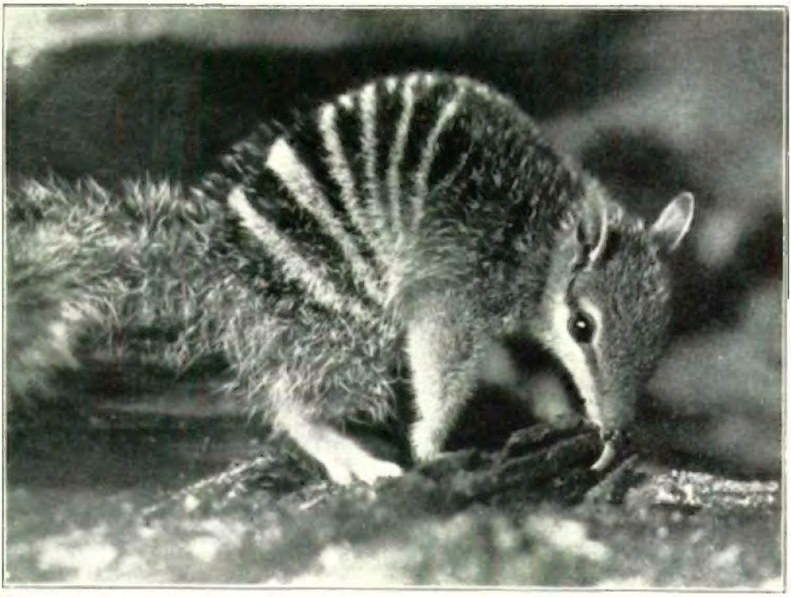
When hurrying over the ground the Numbat bounds in a series of leaps, but in "slow motion" it indulges in a trotting action. Normally the tail is carried "at the trail," in a line with the body, but with a slight upward curve, and the hairs are not bristled. The arching and spectacular fuzzing of the tail over the back occurs in moments of excitement and conditions of emotional stress generally.

In colour the Numbat is one of the most outstanding of all native animals. Anything short of a colour photograph cannot do it justice. Bright rust-red is the general tint of the fore part of the body. Six or seven white bars cross transversely between the tail base and mid-back region, and the fur between these bars is black. The individual hairs of the body are comparatively coarse, and longer ones with white tips give a remarkable halo-like effect about the animal in general. A dark cheek-stripe running to the ear and a white one below it give the Numbat's face—otherwise so like that of the brush-tailed Phascogale—its distinctive appearance. The tail previously mentioned is long and uniformly clothed with stiff hairs, which may be rapidly bristled to form a bold and handsome brush.

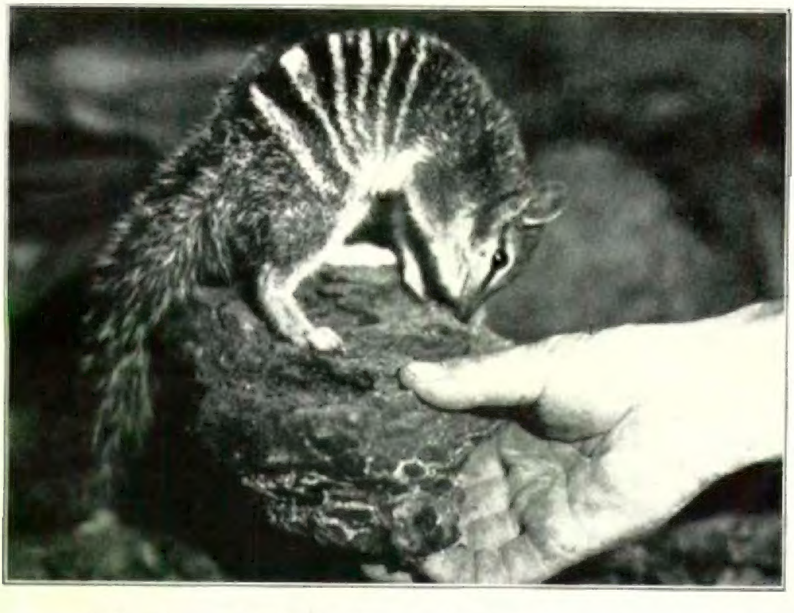
The many accounts of the delicate nature of *Myrmecobius*, and its unfavourable reaction to conditions of captivity, had caused a good deal of uncertainty about the transportation of one of these animals to Victoria. Hopes were not particularly bright when the little creature (a young female) proved on arrival to be in a torpid, sluggish state. However, I had seen many of the smaller marsupials in this dormant, lizard-like state of lethargy, and I was not hopelessly pessimistic of the outcome.

On her first morning in Victoria the Numbat was as lively as a cricket. She refused *all* food until the early afternoon, and then from offerings embracing termites, several species of ants and their eggs, mealworms, beetles, grubs, earthworms, raw egg, bread and milk, honey and jam, she concentrated on the termites and

PLATE I



"Going for the lick of her life!" Close-up of the Numbat's sticky, extensile tongue extracting termites from their galleries in "honeycombed" wood.



So engrossed is little Miss Numbat in licking termites from their galleries that she fails to realize that she has been lifted from the ground.

Photos. by David Fleay

licked up every one in sight, or, more correctly, within "smell," for the olfactory sense is highly developed. The outstanding feature of the Numbat's meal-time was the spectacle of her amazing pink tongue flickering with lightning rapidity deep into every crevice of termite-riddled wood, its tip shooting out at all angles inches away from the animal's snout.

This cylindrical extensible tongue is at least four inches long. Members of the smaller species of termites were gathered in and swallowed whole without chewing, but the larger "white ants," particularly those of the soldier or fighter caste with the strong heads and formidable "jaws" of such a robust species as *Calotermes insularis*, common in mountain ash timber, were subjected to rapid and audible mastication—the animal pausing meanwhile before gathering up further victims. Though the teeth of *Myrmecobius* are regarded as degenerate, there is a very large number of them, fifty-two in all; that is, twenty more than the total number bequeathed to man.

Returning to early experiences with the newly-arrived Kojonup Numbat, it was found that her sluggishness and unhealthy appearance persisted, particularly in the mornings, for several days following her arrival, and on November 30 she remained torpid all day and refused to eat. Cold and stiff to handle, she could scarcely struggle over to right herself when laid upon her back. However, that cheerless twelve hours appeared to end our troubles. From the early morning of December 1 she did not look back. Termites and yet more termites—easily 10,000 of the smaller species daily—were demanded.

Little Miss Numbat's capacity for these soft-bodied light-shunning insects appeared to be inexhaustible, and slowly but surely the old stumps and fallen logs of Badger Creek paddocks and surrounding bushlands were reduced to chips and splinters. Old crumbling stumps were the usual "bonanzas" where, despite many a "red-hot" sting from bull-dog ants, a spherical basement nest of termites would yield such a colony that the community strength in the central regions was astounding indeed.

In the time of its feeding habits the really outstanding feature of the marsupial Ant-eater impressed itself upon one's notice by its very strangeness. In direct contrast to the nocturnal habits of nearly all marsupials, the Numbat frisks about and feeds freely all day and sleeps soundly at night! Never did we see little Miss Ant-eater out after darkness had fallen. She had chosen a hollow log and in furnishing it with home comforts had been seen to carry in dead leaves and to strip dry grass, after much vigorous jerking and pulling with closed jaws, from an old tussock. Quite a comfortable bed was constructed in this chosen home. She never stirred from her "boudoir" after dusk. Possibly she was dreaming of termites yet to come!

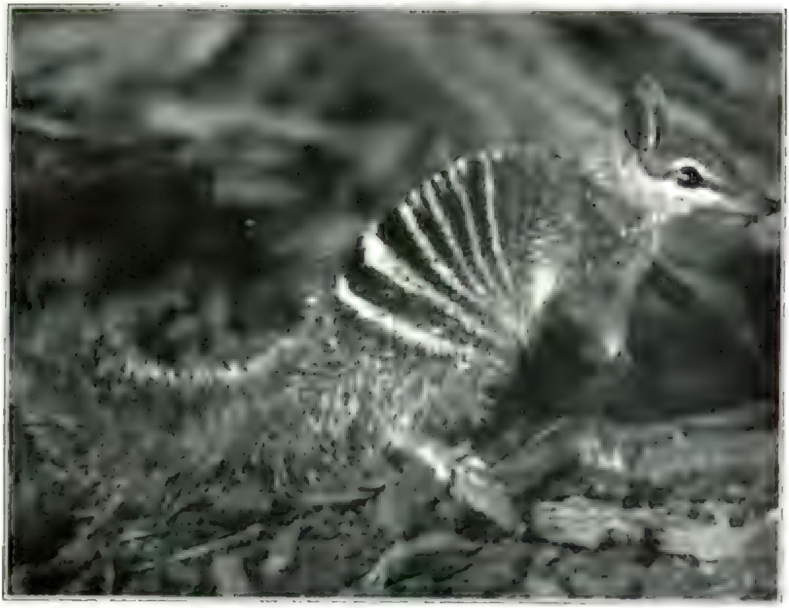
Each morning, as soon as a fresh bucket of "white-ant" material was brought along, the Numbat (who, in her eagerness usually jumped into the bucket) would devote undivided attention to the job in hand, "going for the lick of her life." Nothing could distract her. Her powers of concentration on the minute soft-bodied insects were unique. Sugar ants (*Camponotus nigriceps*) mixed with the rubble occasionally clung to her legs, but, without the slightest interruption to her tongue-work, a lightning flick of each foot in turn would throw the intruders many feet away.

Were the termites deep down in hidden galleries in a piece of wood, the Numbat endeavoured to solve her difficulties by opening her jaws—seizing the whole fragment and pulling it into a more favourable position. Her sturdy and prominent fore-claws were used to good effect in scratching into rotten wood, and the long snout was also brought into play as a lever to force fragments of earth or wood apart. It was most noticeable that she preferred termite-riddled wood, so that the insects could be extracted cleanly from their galleries. Once they had fallen into the dust-rubble and general debris of a broken-up stump, the Ant-eater was most diffident about collecting them, obviously disliking the accumulation of wood-dust on her long sticky tongue and being unable to collect her victims in quantity. Evidently in Western Australia very rotten stumps, old crumbling logs and soil-building termites are sought, for *Myrmecobius* is not strong enough to break apart anything but very decayed or earthy material. It is probable that the animal finds little difficulty in scenting and scratching out colonies of such a species as *Heterotermes ferox*, a termite found in South-western W.A. as well as in S.A., Victoria and N.S.W. This "white ant" is generally found in small colonies living under stones and in galleries in the soil beneath.

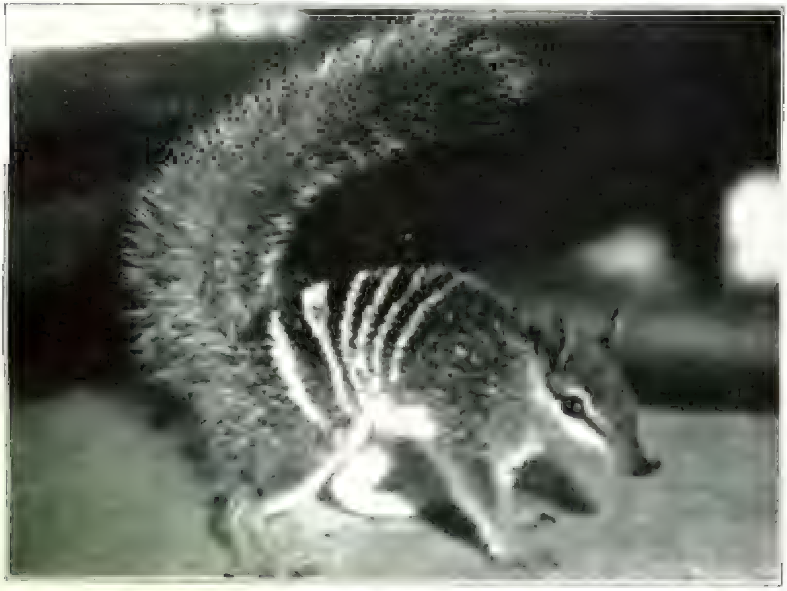
In spite of the provision of many species of true ants and other insects procurable in the Healesville district, it appeared quite definite from the captive animal's behaviour that the Numbat is practically entirely a "white ant" eater. In fact, Banded Termite-eater might have been far more apt a name than Banded Ant-eater. Admittedly our animal did devour odd ant eggs and some ant larvae and cocoon-enclosed pupae, but only when hungry, and she always passed them by in favour of "straight" termites.

In working for her food the vigour and rapidity of the dainty creature's movements was amazing. She became most annoyed if touched when working on a good "prospect," and uttered low-toned churring noises of protest that could be likened to sounds of heavy breathing. Should the animal be gently pushed away from her food, she usually retaliated by pushing back or leaning hard against one's hand while feeding persistently. Once, while scampering about, the Numbat was heard to give a rapid and very Phascogale-

PLATE II



"What was that?" Characteristic attitude of alertness. When really alarmed a bolt straight home is adopted by the Numbat.



With tail fully bristled and arched over her back, this [illegible] presents a picture of beauty and passive grace.

Photos. by David Fleay

like series of "tut-tut-tut-tuts!" evidently representing calls or conversation in the Myrmecobius "tongue."

It was noted on a number of occasions that following a hearty meal, when her abdomen was quite hard and bulging with its solidly-packed termite content, the Numbat scampered to a broad log, upon which she was in the habit of resting, and stretched herself with long fore-limbs extended, tail straight out from the body, and jaws yawning widely. The astonishing feature of the whole languid attitude lay in the outward and downward extrusion in a graceful arc of the whole four inches of pink ribbon-like tongue.

The Numbat is not a burrow-making creature, and, contrary to general belief, is quite a clever and nimble climber and would experience little trouble if need be in searching for termites in crumbling stumps some distance above ground.

Should anything ever startle the little Kojonup creature—a most uncommon event—she would immediately sit bolt upright, with black eyes popping and downbent fore-paws, resembling in miniature the attitude of a kangaroo. At such times her puzzled expression seemed to ask, as plainly as possible, "What on earth was that?" The disregard of danger in the presence of food, so typical of many marsupials, is well pronounced in the case of the Numbat. When the little animal at Healesville was picked up, she made no attempt to struggle and had not the faintest inclination to bite.

Unfortunately, in February, 1942, tragedy brought the Numbat chapter to a sad conclusion. With startling suddenness, on the first day of that month the little animal collapsed and died within the space of several hours, stunning us with the unexpectedness of her death. She had been at the Sanctuary for just over two months. Perhaps I had not obtained quite enough termites, though goodness knows millions were procured. A more likely explanation of the Numbat's untimely death may have been a bite from a Red-back (Katipo) spider. These venomous creatures live in numbers in the warm house inhabited by the Numbat, and more than once I have killed them in the very log in which her nest was built.

From all accounts of the Banded Ant-eater in its Westralian habitat, it relies entirely on hollow logs as a refuge, and consequently bush fires wreak havoc with the small creatures. Fires, combined with the destructive work of foxes, cats and dogs, would seem to spell the end of this too-trusting animal not so many years hence, unless, of course, some strictly-regulated areas in West Australia's Numbat country can be set aside as Ant-eater territory. Many excellent fauna sanctuaries have been established in the Western State, but in order to preserve the Numbat it will be essential to guard continually against fire, to shoot and poison, and to design special fences as preventive measures against the marauding foxes and cats of the bush.

ADDITIONS TO THE ORCHIDACEAE OF VICTORIA

(The Genus *Prasophyllum*, R.Br.)

By W. H. NICHOLLS, Melbourne

1.—*Pr. diversiflorum, sp. nov.*

Planta sub-robusta vel gracilis 30-60 cm. alta. Folia marcida in omnibus meis specimenibus. Flores varii 10-36, viride-fusci; ovarium pyriforme, pedicellus brevis; sepalum-dorsale ovato-lanceolatum, cucullatum, apice brevi-acuminatum; sepala-lateralia separata, erecto-patentia, lanceolata, concava, apicibus plerumque bidentatis.

Petala linearia, incurvata, acuta, aliquando manifeste-falcata; Perianthi-segmenta sub-aequalia, 5-9 mm. longa.

Labellum unguiculatum, concavum, basem versus saepe latissimum; apice emarginato, obtuso vel acuminato, aliquando complicatum apud sinum, marginibus cristis vel undulatis raro planis depressum et aliquando sub-constrictum; lamina callosa elevata, apicem versus canaliculata, aliquando constricta et rugosa vel superposita, super majorem partem callosum. Columna brevis, laciniae laterales magnae, apice obliquae. Stigma reniforme, viscidum.

A moderately robust or somewhat slender plant 30-60 cm. high. Leaf-lamina withered in all the specimens seen (about 40), but apparently slender-terete, varying in length, but often exceeding the spike. Flowers variable in size, 10-36 (in my specimens), green with red-brown markings, in a more or less crowded spike, ovary pear-shaped, pedicels very short, the subtending bracts small, depressed; expansion beginning in middle of spike, extending upwards and downwards. Dorsal sepal ovate-lanceolate, usually incurved, 5-nerved, tip shortly acuminate; lateral sepals prominent, lanceolate, concave, outer margins incurved, quite free, erect, divergent, 3-nerved, tips usually bidentate. Petals linear, incurved, acute, in some few flowers prominently falcate, obtuse, 3-nerved. All perianth-segments of about equal length—5-9 mm. Labellum on a short broad movable claw, oblong-cuneate, deeply concave throughout, often very broad towards the base, reflexed (but not markedly so) just beyond the middle, tip narrow, the apex either emarginate, obtuse or acuminate; membranous portion white, suffused with pink, about as broad as the callous part; in some flowers a horizontal fold at the flexion, the whole depressed from the bend upwards; margins crisped or merely undulate, rarely smooth, or somewhat laterally pinched beyond the flexion; callous part green, not prominently raised except towards the tip, divided by a furrow (throughout its length in most flowers, in others terminating near the apex), the furrow widening to a definite channel below the bend.

In some flowers the callous plate also is constructed near the tip, the apical portion appearing as a separate raised somewhat wrinkled callosity as in some species of *Microtis*. Occasionally this raised portion is superimposed over the larger callous part, extending downwards to the bend.

Column short, appendages large, with more or less hatchet-shaped oblique tips, a small rounded lobe at the base. Anther much shorter than rostellum, reniform, red. Rostellum triangular, higher than the appendages, tip emarginate after removal of disc. Pollinia 2-bilobed, caudicle linear of medium length; pollen grains small, depressed (in those examined). Stigma reniform, viscid.

The new species is probably one of the most variable, in regard to the floral characters, on record (W.H.N.), yet *Pr. patens*, R.Br., appears to be its nearest affinity.

Flowering during December, January, February.

Habitat: Gorae West (via Portland); Collector: Mr. Clifford Beauglehole.

"During the winter months the area of several hundred acres (known locally as 'Malseeds'), where this orchid flourishes, is covered to a depth of 2 or more feet of water; really it is a wide creek bed, a natural watercourse; a favourite feeding-ground for emus and kangaroos. The fact that the season 1941 was the driest for 25 years probably explains why this orchid had not been recorded before. Other ground orchids that occur here include *Pterostylis falcata*, *Caladenia carnea* and some *Microtis* species." Habitat: Flat, heavily-timbered country, rather rough, in black loam soil.

2.—*Pr. Beaugleholei, sp. nov.*

The recent discovery in Victoria of the Tasmanian *Prasophyllum nudum*, Hooker fil.,[1] at Gorae West (via Portland), is, I venture to say, one of the most interesting and important in the history of Australian orchids for many years. This discovery, though it concerns most diminutive (comparatively) plant forms, opens up a long-standing and somewhat complicated question of nomenclature directly involving two or more very distinct specific forms. Two of these species have been described, strange to relate, by the same authority, under the same specific name. One form is credited with a wide distribution, viz., *Pr. rufum*, R.Br.[2] This orchid is the New Zealand *Pr. nudum*, Hooker fil.[3] The Tasmanian plant, to which Hooker also gave the name of *Pr. nudum*, is actually very distinct and identical in every particular with the newly-found Victorian material found at Gorae West and its vicinity.

Pr. rufum, R.Br.—Bentham referred Hooker's *Pr. nudum* of New Zealand to this Australian species, and it is recognized as such in New Zealand now.[4] Incidentally, Hooker considered his *Pr. nudiscapum*, which he records from Tasmania, and *Victoria* also, identical with his New Zealand species *Pr. nudum* (*Pr. rufum*, R.Br.) while Bentham relegates the former to Lindley's *Pr. brachystachyum*. After careful examination of all available material and the original descriptions, I agree with this *circle* of conclusions, for I can find no feature to distinguish *Pr. brachystachyum* specifically from *Pr. rufum.*

It would be well to mention here that all the specimens under *Pr. brachystachyum,* Ldl., from Victorian localities are misdetermined specimens of *Pr. nigricans,* R.Br. This well-marked species, some little time after the flowering period has passed, loses its characteristic dark colouring, changing to a glaucous green with old-gold markings, before finally withering.

Rodway[5] despite Archer's admirable figures (under *Pr. nudum,* Hk.f.) in the *Flora Tasmanica;* also reduces this form (apparently following prior authorities) to a synonym of *Pr. rufum.*[6] Bentham[7] likewise adds to the confusion when he writes: "The plate of *P. nudum,* Hook. f., above quoted (*Fl. Tasm.*) represents the species correctly as to the general figure, but the analysis, unfortunately, must have been taken from a flower of the *Pr. intricatum.*"

It should be noted that *Pr. intricatum,* C. Stuart, is synonymous with *Pr. Archeri,* Hk.f.[8]

Concerning *Pr. rufum,* R.Br.: This species differs materially from *Pr. Archeri,* Hk.f., also from the Tasmanian "*Pr. nudum,* Hk.f.," in having entire margins to a much narrower and more acute labellum, and also non-ciliate appendages to the column. Hooker writes, in reference to the last mentioned plant, "a near relation of *Pr. Archeri,* yet distinct." This sums up its relationship, and its closest affinity.

From *Pr. Archeri,* Hooker's *Pr. nudum* (*Fl. Tasm.*) differs mainly in the longer inflorescence and smaller, more abundant flowers; the relative lengths of the perianth-segments, broader labellum (possessing distinctive characteristics) and a different column. Thus it seems somewhat strange that so distinctive a form should have caused perplexity.

I am again indebted to Mr. Clifford Beauglehole for my specimens of this intriguing *Prasophyllum.* The three original specimens found at Gorae West were handed to him by a young collector (Master W. Phillips, age 13) and were collected on the property of Mr. Phillips, senr.

In all, fourteen flowering plants have been noted in this area, the majority, however, being in advanced fruiting stage. Even in this condition, and also when in early bud, the species may with certainty be easily known from other described Victorian forms by *the characteristic lateral sepals.*

The Gorae West specimens were growing "in black sand, inclined to be peaty, somewhat dry, fairly wet in winter, with Bottle-brush and Tea-tree (in association); also some fern growth 2 feet high—the position well-shaded from the sun." The additional locality already mentioned for this *Prasophyllum* was found on the 24th February by Mr. Beauglehole himself; approximately 2 miles west from Gorae West. (The original find was on the 10th Feb.)

Three additional specimens were found here, including a remarkably robust, many-flowered plant, possibly representing the maximum development in the species. This habitat is "a peaty swamp, a dangerous locality for walking"; it gave the searcher "the creeps."

In consequence of the prior use of the specific name of ***nudum*** for Hooker's New Zealand species, which is now correctly interpreted as the species which Robert Brown had long before named *Pr. rufum,* the re-use of this name by Hooker for the Tasmanian plant is therefore invalid. Thus a new name must be given to the latter, which has (so surprisingly!) turned up in Victoria also. Archer's figure (previously quoted) shows a filiform leaf-growth arising from the sheath. Such an occurrence is not uncommon in *Pr. Archeri* in alpine regions. It probably is found in other somewhat similar species also.

I am re-naming Hooker's *Pr. nudum* of the *Flora Tasmanica* after Mr. Clifford Beauglehole, for it is mainly through his keenness that this little terrestrial orchid has been rediscovered, in this instance on the mainland of Australia. This indefatigable collector was instrumental in the finding also of *Pr. diversiflorum, sp. nov.*, and of *Pr. fusco-viride*, Reader, the last-mentioned gem a new record for S.W. Victoria.

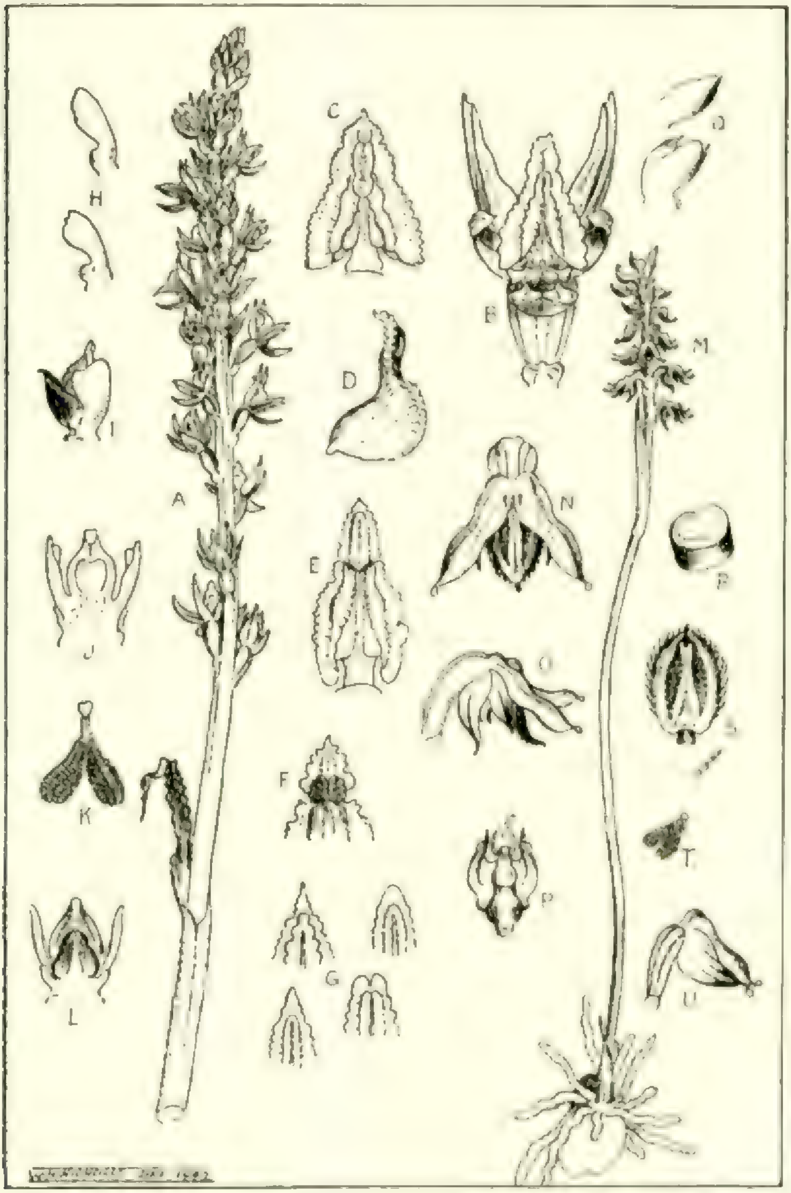
Prasophyllum Beaugleholei, sp. nov.

Planta gracillima, circa 10-20 cm. alta; super caulis medium bractea subulata. Inflorescentia spica laxiuscula vel compacta circa 1.5-3.3 cm. longa; flores 5-42, parvi deflexi atro-purpurei badii vel virides, pedicelli breves; sepalum dorsale manifeste cucullatum 1½-3 mm. longum, apice glandulosus; sepala lateralia circa 2½-3 mm. longa, patentia lanceolata, concava, basi connata, apicibus glandulosis; petala triangularia lanceolata, acuminata, 1½-2½ mm. longa. Labellum unguiculatum, ovatum, semi-recurvum, 1½-3 mm. longum, marginibus brevi-ciliatis, laminae pars callosa bifida, duobus partibus, parallelis papillosis, elevata, exiguo sulcato inter partes; Anthera longe mucronata. Laciniae laterales bifidae, marginibus anterioribus ciliatis; stigma orbiculare concavum.

A very slender plant usually about 10-16 cm. high (robust specimens up to 20 cm.) Tuber globular or of irregular shape. Base of stem with a fibrous sheath, often with the remains of old tubers attached. Stem usually wiry (in robust specimens 3 mm. thick). Fruiting specimens often attain a length of 30-35 cm.

Leaf-lamina below the inflorescence, sheathing bract-like, 2-3 cm. long. Flowers very small, 5-42 (in my specimens), sessile, green and red-brown or purplish-black, somewhat deflexed. Ovary long, curved, a minute rather blunt bract at the base. Dorsal sepal conspicuously hood-shaped, erect 1½-3 mm. long, tip with a gland at the apex, lateral sepals connate at the base, about 2½-3 mm. long, lanceolate, concave, erect, divergent, tips with a prominent gland. Petals slightly shorter than dorsal sepal, triangular-lanceolate, acuminate.

Labellum *ovate* with a short acute apex, semi-recurved, fleshy,



Prasophyllum, spp.; two main figures slightly reduced. (For Key, see p. 14.)

surface raised, *papillose*, green with deep red-brown or purplish-brown markings, about same length as dorsal sepal, attached to a prominent columnar projection by a movable claw, margins shortly ciliate, *cilia inclined towards the tip*. Individual cilia glandular, callous portion raised, divided into two parallel sections by a narrow groove, which is wider at the base, each section lanceolate, uniting at the tip in a dark-coloured blotch (in most flowers examined); membranous part about same width as raised sections. Anther with a moderately long point. Pollinia 2, no caudicle. Rostellum shorter than the anther. Column appendages prominent, outer lobes purplish, much narrower and slightly longer than the inner lobes, outer margins *minutely ciliate*. Inner lobes broad, rounded, not coloured, margins entire. Stigma circular, concave. Flowering period: January, February, March. Distribution: Tasmania, Victoria.

Hooker's locality for this species is unknown, for he records "Tas.: but I do not know where." Thus the following Victorian habitats are the only known ones, viz.: Gorae West (W. Phillips et C. Beauglehole); two miles west from Gorae West (C. Beauglehole.)

3.—Pr. fusco-viride, Reader.[9]

This rare and attractively coloured species is on record only from Yorke Peninsula in South Australia, and from Dimboola in Victoria, Dimboola being the original habitat. It has now reached me from Bridgewater (via Portland). Collector: C. Beauglehole, March 5th, 1942. The Bridgewater flowers differ from those of Dimboola only in having a conspicuous white gland inset at the tip of the labellum—a feature represented in the Dimboola flowers by a dark-coloured blotch.

4.—Pr. flavum, R.Br.[10]

R. D. FitzGerald's plate in *Australian Orchids*,[11] under *Pr. australe*, R.Br. has often created interest and speculation as to the true character of the form he figures. It is, however, but a sturdy specimen of Robert Brown's *Pr. flavum*, minus the characteristic yellow tinge of the typical form. The present writer and Mr. F. J. Bishop discovered this dark green form on the track from Stringer's Creek (via Walhalla) to Mt. Erica (E. Vic.) during the year 1923, also on two subsequent journeys. This form varied in height from 30 cm. to over 70 cm. and the flowers number from about 12 to over 70. Almost wholly green, the other colour, dark-brown, was more or less inconspicuous, and the labellum white. This green form appeared to be restricted to the rock-strewn slopes of the lower hills, in more or less unsheltered positions; the surrounding vegetation, besides the low-growing Eucalypts, consisting mainly of *Cassinia longifolia*, *Helichrysum semipapposum* and a *Goodenia* sp.

Several photographs were secured of plants growing right on the main highway only 18 inches from the vehicle tracks. The normal yellowish form also occurs hereabouts, higher up where the big gums grow. The difference between them, though striking at first glance, is confined to the absence of the yellow colour (in the green form) and the incurved floral segments. Thus not sufficient variation exists to warrant a varietal name. On the other hand, FitzGerald's plate of *Pr. flavum*[12] represents a small form which must be very rare indeed—if the artist has not exaggerated the yellow colour of the blooms, here shown as golden-yellow. FitzGerald's material of the green form was collected in New South Wales (Loc., Conjola lake, near Ulladulla).

5.—*Pr. Morrisii*, Nich., variety *contortum*,[13] n. var.

Planta robusta, circa 30-35 cm. alta. Labellum ovato-cuneatum, basi latum, apice contortum.

A comparatively robust plant about 30-35 cm. high. Flowers larger than those of the typical form. Labellum ovate-cuneate, the base very wide; apex of labellum with a peculiar undulate, somewhat contorted twist.

Habitat: Pyrete Range (via Gisborne). On rocky ledges in ironbark country, in association with *Caleana major*, R.Br. (Collector: G. Lyell, F.E.S.)

REFERENCES

1. *Flora Tasmanica*, ii, 14, tab. 113 (partly), (1860).
2. *Prodromus Flora Novae Hollandiae*, p. 319, (1810).
3. *Flora Novae Zealandiae*, i, p. 242, (1853).
4. *Manual Flora New Zealand*, p. 676.
5. *Tasmanian Flora*, p. 194, (1903).
6. See also *Flora Australiensis*, vi, p. 344, (Bentham): *Flora Queensland*, v., p. 1570, (Bailey).
7. *Fl. Aust'sis*, vi, p. 344.
8. *Victorian Naturalist*, xlviii, p. 110.
9. *Ibid*, xiv (1898), p. 163; *Trans. Roy. Soc. S. Austr.* (1909), xxxiii, p. 206 (under *Pr. Tepperi*, Muell. et Rogers).
10. *Prod. Fl. Nov. Holl.*, p. 318.
11. *Australian Orchids*, ii, pt. 1.
12. *Ibid*, i, pt. 3.
13. *Vic. Nat.* (Oct., 1931), pl. iii, Figs e, j, o, s (Lab. et col.)

KEY TO PLATE

Prasophyllum species

A.—Flowering spike of *Pr. diversiflorum*, *sp. nov.*
B.—Flower from front of *Pr. diversiflorum*, *sp. nov.*
C.—A Labellum from front of *Pr. diversiflorum*, *sp. nov.*
D.—A Labellum from side of *Pr. diversiflorum*, *sp. nov.*
E.—A Labellum from front of *Pr. diversiflorum*, *sp. nov.*
F.—Labellum tips of *Pr. diversiflorum*, *sp. nov.*
G.—
H.— Column appendages of *Pr. diversiflorum*, *sp. nov.*
I.—Column from side of *Pr. diversiflorum*, *sp. nov.*

J. Column showing stigmatic plate etc. of *Pr. diversiflorum sp. nov.*
K.—Pollinia of *Pr. diversiflorum, sp. nov.*
L.—Column showing Anther of *Pr. diversiflorum, sp. nov.*
(Note figs. B, C, E and F show the most important variations in the labellum.)
M.—A typical specimen of *Pr. Beaugleholei, sp. nov.*
N.—A flower from above of *Pr. Beaugleholei, sp. nov.*
O.—A flower from side of *Pr. Beaugleholei, sp. nov.*
P.—Column showing stigma, etc., of *Pr. Beaugleholei, sp. nov.*
Q.—Column appendages, showing variation of *Pr. Beaugleholei, sp. nov.*
R.—Cross-section of stem of *Pr. Beaugleholei, sp. nov.*
S.—A Labellum from front, also individual cilia of *Pr. Beaugleholei, sp. nov.*
T.—Pollinia of *Pr. Beaugleholei, sp. nov.*
U.—A bud of *Pr. Beaugleholei, sp. nov.*

THE RAINBOW-BIRD AS A BEE-EATER

I have recently come upon some notes, laid aside for several years, which Mr. Henry Tryon, former Government Entomologist of Queensland, wrote in regard to the Rainbow-bird (*Merops ornatus*), sometimes termed the Bee-eater. They include the following observations:

That *Merops* does not exclusively or principally feed upon bees will appear from the fact that in examining the stomachs of five individuals obtained in different parts of Australia, at different times of the year, all were found to contain insects exclusively, of different orders, but none of these were bees, and the last *Merops* stomach whose contents I scrutinised contained five dragon flies, twelve meat ants, and other insects in a fragmentary condition. As is well known, meat ants are natural enemies of the honey bee, amongst other insects.

Under the conditions inseparable from bee-keeping, the undoubted habit of capturing bees may be very apparent, but the birds' less obvious habit, but one persistently exercised, with respect to other insects, is commonly overlooked. Attention is seldom drawn to this habit of *Merops* except when the swarms are very weak and there is little or no flow of honey to sustain the hive. Then, if the bee-eaters are found feeding about the hives, and giving their attention largely to capturing bees, failure in honey production on the part of the hive is wont to be put down exclusively to their depredations.

Paradoxical as it may appear, observations indicate that the bee-eating habit exercised at this time, and at such season, actually is in the interests of the apiculturist. This is brought about by the fact that whilst the bird at certain times captures bees frequenting hives under control, it at all times and in all seasons preys on honey bees that, having "gone wild," have become established generally in the bush. Thus it serves in so doing to remove competitors for the greatly reduced supply of honey yielded by the native flora, on the amount of which the very existence of the apiary is at all times dependent.

In fact, did not the wild naturalized bees meet with an enemy in the bird in question, it would go hard indeed for the apiarists' industry when a severe drought reduced almost to a vanishing point the ordinary sources whence the honey of the hive was garnered. This remark also applies to the other native birds that to a greater or less extent capture and consume bees.

However, all bee-consuming birds may not be as harmful as at first sight would appear. In Europe the Redstart has been blamed for exercising the habit, but J. O. Owen has pointed out (*Birds—Useful and Harmful*) that whilst this bird does capture honey bees, it confines its attention almost entirely to the comparatively useless drones.

A.H.C.

THE STORY OF THE MURRAY RIVER

By A. S. KENYON, Melbourne

(*Continued from April issue*)

The next event in the Murray River story is the discovery of Lake Alexandrina, the Murray mouth, by a boat's crew of Mr. Duncan Forbes in the year 1829, while in command of the sailing schooner *Prince of Denmark*. Meanwhile Cunningham, in 1827, had found the Namoi, Gwydir, Macintyre or Dumaresq, and the Condamine.

Charles Sturt now appears accompanied by Hume. Sturt, a military man, was 32 and Hume now 30. The problem of the whereaway of all these streams—the Macquarie, Bogan, Namoi, Gwydir and Macintyre, all trending to the north-west; and the Lachlan, Murrumbidgee, Hume, Ovens and Goulburn, all converging to a possible effluence in Spencer's Gulf or thereabouts—worried the colonists grey-haired. Governor Darling sent Sturt and Hume out at the end of 1828, a year of bad drought. On the 18th January, 1829, they came on the Darling heading to the same point as the southern streams, after gathering the flows of the northern rivers. It was the end of the theories of an inland sea and north-western Australian outfall. But the drought conditions—the Darling itself was salt—precluded investigation in that direction. Sturt returned to Sydney and by the end of the year started another expedition, to follow down the Murrumbidgee, as a more reliable route. This time Hume stayed at home and looked after his crops.

Sturt abandoned his drays, his cattle and most of his party and embarked in boats from a depot near the present town of Maude on the 7th January, 1830. Exactly a week later—let us have his own words:

> "On a sudden, the river took a general southern direction but in its tortuous course swept round to every point of the compass with the greatest irregularity. We were carried at a fearful rate down its narrowed and contracted stream. At 3 p.m. Hopkinson called out that we were approaching a junction, and in less than a minute afterwards we were hurried into a broad and noble river."

Reaching the Darling Junction on the 23rd, covering a little over twenty river miles a day, they named the stream *Murray*, after Sir George Murray, then Colonial Secretary, not wotting that it was Hume's Hume.

Later on Sturt was sorry. In his report on his May-August, 1838, overlanding cattle trip from Albury to Adelaide he says:

> "I have thus, Sir, conducted you to that point at which the Hume uniting with the Murrumbidgee, both rivers cease to bear their respective names and form the Murray of my second expedition . . The Hume, however, is a noble and beautiful stream, and that it should bear his name is sufficient to satisfy the ambition of any man. I by no means wish to take away from the credit of another, much less from that of Mr. Hume, whose superior

> talents as an explorer I have ever been ready to admit. When I named the Murray I was in a great measure ignorant of the other rivers with which it was connected. But if my knowledge then had been as extensive as it now is, I should still have considered myself justified in adopting the usage of modern travellers and in giving a name to that river down which and up which I have toiled more than 4,000 miles. It was a task that I humbly conceive fully entitled me to so negative a privilege. The colonists have, however, continued to the upper branch of the river the name given by me to its lower part only. I trust, therefore, that this explanation will confine all three (Murrumbidgee, Hume and Murray) to their proper limits. I want not to usurp an inch of ground or of water over which I have not passed."

The colonists were right: one river, one name is the only practicable way. That the river should have retained its first name, the Hume, may be conceded, but Hume saw only a few miles of it, whereas Sturt's epic journey down his Murray River fired the public imagination. It is certainly too late to change the name now. We have, however, the Hume Reservoir or Dam, the Hume Highway, Humevale (formerly Scrubby Creek, near Whittlesea), and possibly Humanton near Yass, as well as thirty odd cairns along the route in Victoria alone.

Now let us get back to the completion of the discovery of the Australian Nile—and that is not a misnomer, for the Murray comes fourth in the list of the world's great rivers. Strangely enough, *Whitaker's Almanac*, our great British standby, gives neither the Murray nor the Darling, but the *World Almanac*, a U.S.A. production, honours the Murray with a notice, although not in its correct position. It uses the Mississippi-Missouri combination (3988 miles) to achieve second place to the Nile (4000 miles) thus beating the Amazon by a wee bit (3900 miles). Then comes the Murray-Darling (3282 miles) with the Obi on its tail (3200 miles) and the Yang-tze (3100). No other terrestrial stream gets to 3000. But in watershed (that is, theoretical drainage area and not actual), it is away behind, coming ninth only, although it drains—save the mark!—414,253 square miles, one-seventh of the whole continent, a similar proportion of Queensland, no less than three-fourths of New South Wales, more than half of Victoria, and a trifling area in South Australia.

There are, however, two records which it holds impregnably secure from seizure: they are, a minimum flow of precisely nothing at all and a minimum proportion of annual run-off, 3 per cent. While dilating on these records the following may be added: The surface fall from Echuca to Euston is four and a half inches to the mile, and from there to Mildura three and three-quarters. The river at Mildura is just 100 feet above sea level, and as it is 550 miles from the Murray mouth the fall for that section is just over two inches to the mile, although in its lower reaches (say from Morgan south) the fall is almost too small to measure.

The navigable length of the Murray, once in a while, is over 3500 miles—1400 on the Murray itself (Goolwa-Albury), 1200 on the

Darling (Wentworth-Walgett), 700 to where the dog sat on the tucker-box, and 350 on the Edward, Wakool and Goulburn.

Navigation was first predicted by Captain Sturt, again by Joseph Hawdon and Captain John Hart, and finally given effect in 1853 by Captains Cadell and Randall. It is, however, now a thing of the past, and save for a few peddling or hawking boats and the magnificent tourist trips, the once imposing fleet of steamboats exists in photographs only.

On the other hand, its use for irrigation and water supply is still increasing and will shortly reach its maximum—some two to three million acres irrigated and eighty million acres supplied with stock and domestic water.

Leaving statistics behind we shall resume the discovery tale. We have mentioned the headwaters—McKillop, 1825; the river at Albury, 1824; the outlet, 1829; the Darling and its tributaries, 1827-9; the Murray and Murrumbidgee, 1830; the Murray from Hume's chance discovery to the Goulburn Junction, 1838. Sir Thomas Mitchell was not satisfied with Sturt's identification of the Darling at its junction with the Murray. In 1835 he followed Sturt's footsteps to the Darling and traced it down to Menindie, but he still clung to the idea that Sturt's Darling was actually the Lachlan.

It was in March, 1836, that the Major (also so known to early Victorians), started on his Australia Felix trip. He found that Sturt was quite right so he decided to follow up the Murray River—now the established name. Crossing a little over a mile below the Murrumbidgee junction—that is, between the true and the false—he was the first man to see the Hume above it; 16th June, 1836. He saw and named Swan Hill and Lake Boga—Portuguese for swimming-pool. He missed the Loddon and thought the Little Murray and the Gunbower Creek were one stream and were actually the Goulburn. The other guesses by the Major were as bad—first the Yarrayne, then the Loddon, etc., flowing westerly; the Wimmera with an outlet to the sea at Cape Bernouilli, and the Glenelg mouth ten miles or more inside Victoria. All misleading and perplexing in the extreme for his successors.

The next part of the gap remaining between Albury and Cohuna was filled in January, 1838, when Joseph Hawdon, hero of the first overlanding party from Sydney to Melbourne, 1836, set out from his station at Tallarook—he had just returned from running the first mail to the Murray, Melbourne to Howlong, and, much to his surprise, found himself at the junction just above Echuca a week later. We have already related Sturt's work from Albury to the Goulburn junction; the Murray discovery was finished and the Darling ditto.

Round about 1845-6 settlers came down the Murray. Edward Bernard Green had a station on the Edward, but had to abandon it. Several others were in the same boat. Settlement proceeded, however, and as Melbourne was the nearest port traffic became considerable. James Maiden—it is remarkable how this name pervades western New South Wales and the Lower Darling among hotelkeepers, coach proprietors, storekeepers, pastoralists, too, pioneers everywhere—in 1846 established an accommodation house and a punt. It was soon known as Maiden's Punt, though with the usual official ineptitude it was named Moama. Mereweather, the first clergyman in the Riverina, who arrived there in May of 1851, and was stationed at Moolparm, always referred to it as Maiden's Inn. He refers to the sale of town allotments held November 13th, 1851, at Moolamon. The Moama allotments sold remarkably well. Maiden himself gradually acquired property and became a wealthy squatter, but eventually died in poverty in 1860.

The name Echuca was the locality name before the town was surveyed and named officially. It is an aboriginal word meaning "the place of stones." Most people would consider that extremely inappropriate, but actually when the river falls to a flow of almost nothing there are one or two reefs exposed with much gravel, well known to the blacks but not to the whites. Similar reefs or rocks occur right along the Murray to Mildura. The popular version is "the meeting of the waters"—much more attractive and something like the Yarra Yarra, "ever flowing," and equally erroneous.

Echuca was surveyed and named in 1855, though known as Hopwoods for long years after. The railway which was opened in September, 1864, was known officially as the Sandhurst-Murray River line. The coming of the railway was a K.O. for Moama, and Echuca ruled supreme as Mistress of the Murray. When in 1876 a private railway was constructed from Moama to Deniliquin (the Sandhills) the iron bridge, then the finest in the southern hemisphere, was built. It was completed in 1878 and cost £120,000.

As an illustration of the value of roads it is interesting to know that, owing to the abominable state of the road to Bendigo, a bare hundred miles, in the flood years of 1853-4, freight being £6 per cwt.—over one shilling a pound—it was cheaper to send goods to Adelaide by sea, thence by road to Morgan on the Murray, thence by steamer to Echuca and again by road to Bendigo, a total distance of 1700 miles. Small wonder Echuca flourished and Hopwood and Maiden acquired fortunes!

Those interested in the Murray River story should read *The Nile of Australia*, by David John Gordon; *Paving the Way*, by Simpson Newlands; *Half-crown Bob*, by Price Warung, and *Knocking About*, by August Pierce.

(Concluded)

DEATH OF DR. R. S. ROGERS

Naturalists throughout Australia will greatly regret the death of Richard Sanders Rogers, M.A., M.D., D.Sc., F.L.S., who passed away in Adelaide on April 30, 1942.

Dr. Rogers was the greatest orchidologist that Australia has known. True, Robert Brown described more than one hundred species, but he left them there, being a general botanist. FitzGerald named a couple of dozen, and published his monumental work under government aid. Dr. Rogers studied orchids under all conditions, and published many species, not only from Australia, but from Polynesia, New Guinea, and New Zealand as well. A complete set of his writings shows how monumental has been his studies. He has now left the torch for Nicholls and for Rupp to carry on, in the way they know so well.

Dr. Rogers' first essay was a series of articles on South Australian orchids in the *Children's Hour*, a publication of the South Australian Education Department, about 1908. These articles were reprinted in book form, and again reprinted in 1911. At the time, this was our only orchid book. Dr. Rogers' first genus was *Microtis*, which he published in 1906; and from then on he worked incessantly on his great hobby until a few years ago. Realizing the value of illustration he invited that noted flower-painter, Rosa Fiveash, to do his illustrations, and the results of her drawings in both black and colour show how wonderfully she did the work.

Dr. Rogers visited Kangaroo Island in 1908 and collected 35 species, two of which were new to science. In 1919 he visited West Australia, and in addition to re-discovering all of FitzGerald's species of 1881, he collected five new species. In all of his ramblings he was accompanied by Mrs. Rogers, an ardent and faithful collaborator.

Dr. Rogers was a leading physician in Adelaide; he accompanied troops to the Boer War, he was in charge of military hospitals in the Great War; he was City Coroner, president of many institutions; and in all of his work, he was most meticulous in effort and detail. He was slow to publish a new species, feeling that careful study and observation were needed, and thus he could never be classed as a "species splitter."

The death of Miss Fiveash, in 1938, created a break, for without an artist little satisfactory work could be accomplished. Dr. Rogers has left a monument of work; his collection includes hundreds of water-colour and pen-and-ink drawings of Australian orchids; and it is hoped that these will be preserved for the nation. Wars and depressions prevented the publication of a great work with coloured illustrations, and this was a keen disappointment to the doctor.

He always gave of his great knowledge freely; to students he was wonderful in both help and advice. His genial and loving personality were his great charm, and many of us will carry the memory of these great attributes all through our lives.

E. E. Pescott.

Previous References

1. "Australian Orchidology," by Edward E. Pescott. *Vic. Nat.*, Dec., 1932, p. 196. (Includes an excellent portrait of Dr. Rogers and a notice of Miss Rosa Fiveash).

2. "Rosa Fiveash, Flower Painter," by Edward E. Pescott. *Vic. Nat.*, April, 1938, p. 199.

The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the Club was held on Monday, May 11, 1942. The President (Mr. P. Crosbie Morrison) presided and about 60 members and friends attended.

SUBJECT FOR THE EVENING

This was an illustrated lecture given by Mr. N. Lothian on "The Alpine Flora of New Zealand." A good series of photographic studies and lantern slides as illustrations to the descriptive matter gave to those present a good idea of this flora.

Some discussion as to the possibilities of cultivating these plants took place, and several questions were asked, after which the President accorded thanks to Mr. Lothian for his interesting address.

REPORTS OF EXCURSIONS

Reports of excursions were given as follows: Coburg Bad Lands, Mr. F. S. Colliver; Sherbrooke Forest, Mr. H. C. E. Stewart. Mr. Stewart exhibited photographs of a rare fungus found on the excursion.

ELECTION OF AUDITORS

The retiring Auditors, Messrs. A. S. Chalk and A. G. Hooke, were re-elected.

NOMINATIONS FOR OFFICE-BEARERS, 1942-1943

The following nominations were received: President, Mr. P. Crosbie Morrison; Vice-Presidents, Messrs. H. P. Dickins, Ivo Hammett, H. C. E. Stewart; Editor, Mr. A. H. Chisholm; Secretary, Mr. F. S. Colliver; Assistant Secretary, Mr. Noel Lothian; Treasurer, Mr. E. E. Lord; Librarian, Dr. C. S. Sutton; Assistant Librarian, Mr. P. Bibby; Committee, Messrs. G. N. Hyam, J. H. Willis, P. F. Morris, A. S. Chalk and Cedric Ralph.

NATURE NOTES

(a) Mr. A. D. Hardy reported on the large amount of diatomaceous material at present lining the aqueducts of our water supply system, and suggested that it was due to the greater silica content of the waters, which was in turn due to the erosion of the catchment areas owing to bush fires.

(b) Mr P. F. Morris reported on a combat between a silver eel and a cormorant.

(c) Mr. A. A. Brunton stated that whilst on a fishing trip in New Zealand he had noticed a cormorant eat 71 lbs. of fish each day for a week.

(d) Mr. A. H. Chisholm, referring to Mr. Morris's note, stated that similar incidents sometimes took place when a kookaburra caught a snake; there were records of both the bird and reptile killing each other

(e) Mrs. V. H. Miller reported having noticed a number of ferns growing on walls within the city area. Other members amplified Mrs. Miller's statement.

(f) Mr. P. Crosbie Morrison reported that the fly agaric had recently been recorded from Lara, near Launceston, Tasmania. This record, as well as the two Australian ones (Emerald, Vic., and Aldgate, S.A.) have all been traced to the importation of nursery stock.

GENERAL BUSINESS

(a) Forthcoming Excursions.—The Secretary announced that a tree-planting excursion would be held at Maling's Quarry, Balwyn, possibly in July, and asked that members who would purchase a tree or shrub for the excursion notify him by the June meeting.

(b) Natural History Medallion.—The Secretary announced that nominations for the 1942 award should reach him by the end of May in order to be eligible for consideration by the Selection Committee.

(c) Welcome to Visitors.—The President welcomed, among others, Mr. Burbury, a naturalist from Tasmania. In his reply Mr. Burbury stated that as he would be spending a considerable amount of his time in Melbourne he hoped to see more of the Club and its work.

EXHIBITS

Miss E. Campbell—*Hakea laurina*, garden-grown at South Hawthorn.

Mr. H. P. Dickins—Australian flower studies.

Mr. A. D. Hardy.—Dried algae and microscopical exhibit of same. A seed of *Physistigma venenosum*, the "poison bean" or "ordeal-bean" of Calabar.

Mr. A. H. Mattingley—Star-fish (*Asterina*) from the Great Barrier Reef.

Mr. Ivo Hammett—Garden-grown native plants, including *Hakea petiolaris, H. sulcata* var. *scoparia, Grevillea buxifolia, Melaleuca pulchella, Cassia eremophila, Correa pulchella, Baeckia ramosissima, Eucalyptus leucoxylon* var. *rosea.*

Mr. R. G. Painter—Garden-grown native plants, including *Grevillea alpina*, var. *Dallachyana, Epacris impressa, Correa reflexa, C. reflexa* var. *rubra* (two forms), *C. Lawrenciana, Cassia australis, Crotalaria laburnifolia, Plectranthus parviflorus, Melaleuca lateritia, Viola hederacea, Hibbertia fasciculata, Rubus rosæfolius floreplena.*

Mr. F. S. Colliver—Sun-cracks, rain-spots and ripple-marks from the Carboniferous beds at Mansfield, Victoria.

THEY FOUGHT TO A FINISH

I record a most fascinating combat between a Little Black Cormorant (*Phalacrocorax ater*), often known as "Shag," and a common Eel (*Anguilla australis*). The "ring" was the small circular lake in the Melbourne Botanic Gardens, and as six people viewed the contest it is a "fish story" with corroboration.

Round 1. How long they had been fighting I cannot say, for on my arrival they were at it in earnest. The bird had a "head scissors" across the gills of the eel, whilst the latter had about thirty inches of its body tightly rolled around the cormorant's neck. Each showed hereditary instinct of tactics and bluff. The eel seemed to wriggle into a winning grip, and I was about to "tap the mat" when the cormorant dived.

Round 2. On surfacing, the bird had a shorter grip over the eel's mouth, and, not to be denied, the fish again adopted the "stranglehold" with considerable pressure. Both were showing great pluck under severe punishment, and both obviously realized it was a fight to kill. With evidently a winning grip, points were now in favour of the cormorant, which dived again.

Round 3. When under water the eel relaxed its hold, for the bird was able to begin the round with half the fish disappearing head first into its commissariat. Not to be outdone—or done for dinner—the eel set up a "hula hula" action in the bird's throat, and, here realizing that discretion was better than valour, retreated full length into the water.

Round 4. Recovering from its astonishment, the bird dived and appeared with only the finned tail flapping. By extending its whole body vertically and attempting to fly, the cormorant was able to close its pouched bill. But it was as overloaded as a Melbourne tramcar, and the eel, disliking the abdominal darkness, again succeeded in escaping by contortion.

Round 5. The bird apparently had enough and attempted to escape by flight, but it was too wet and weak. A gardener threw a stone which the cormorant escaped by diving, and in about ten seconds it appeared with the eel an easy victim. Fully extending its body and flapping its wings, the cormorant swallowed the thirty or more inches of eel in one gulp.

Round 6. The eel could not rise from his "corner" and the cormorant was declared victorious and allowed to digest his well-earned prize. Thus a member of the class Pisces was defeated by a genius of the class Aves.

The moral of the story is that one must rise to the threshold of public gaze to be recognized and accepted as a genius!

P. F. MORRIS (*Botanic Gardens*).

NOTES ON AUSTRALIAN SEALS

By F. LEWIS, Chief Inspector of Fisheries and Game, Victoria.

(Portion of address to April meeting of F.N.C.)

There are two species of seals now living on the southern Australian coast, these being the White-necked Hair-Seal, or South Australian Seal-Lion, and the Australian Fur-Seal or Sea-Bear. Both belong to the one genus. The only real difference between them is that while they both have soft under-fur in their young stages, in the Hair-Seal the fur is shed as it grows older while the Fur-Seal retains it to the end of its life.

These seals are what is known as eared seals, having small external ears, while the true seals, whose home is the Antarctic, have no external ears. The eared seals also have their hind limbs or flippers turned sideways to facilitate movement on land, while the true seals of the Antarctic have their hind flippers permanently turned backwards, making them more suitable for life in the water.

According to some authorities the range of the Hair-Seal was at one time much more extensive than at present. Le Souef and Burrell state that its range is the whole southern coast of Australia, but that is definitely not so now, as it is not found east of Spencer Gulf. It is stated also that the Fur-Seal formerly ranged right to W.A., but Wood Jones reports that he found no evidence of the species west of Bass Strait.

It appears that one of the first industries established in Australia was in connection with the securing and selling of seal skins and oil. Bass and Flinders in 1798 are said to have taken 6,000 skins and many tons of oil from Bass Strait. In 1805 ten ships and 180 men were engaged in the industry, and from 1800 to 1810 almost a quarter-million seal skins were taken. Is it any wonder that the seals of Bass Strait were almost exterminated?

Old fishermen of Western Port have informed me that about the middle of last century there were only two or three dozen seals left on the Seal Rocks. About 1880 the Government placed the seals under whole-year protection and they have now bred up to what is probably somewhat near their original numbers. There are about fourteen colonies of Fur-Seals in Bass Strait, the four principal ones being on the Victorian coast and the balance in Tasmanian waters. Our four colonies are at Julia Percy Island (off Port Fairy), the Seal Rocks (off Phillip Island), the Glennies (off Wilson's Promontory), and the Skerries, a group of rocks off the mouth of the Wingan River, about 20 miles west of Mallacoota.

The Seal Rocks, of which I have had a good deal of experience, having landed there on several occasions to study the habits of the seals, have a population varying from 3,000 to 5,000 seals in the breeding season, which extends from November to January. Various estimates of the number of seals on these rocks have been made, ranging from 2,000 to 50,000, but it should be borne in mind that the Rocks are only about ten acres in total area and that at least three or four acres of these are high ground not frequented to any extent by the seals. This leaves not more than seven acres, or roughly 30,000 square yards, available, and if 5,000 seals occupied this territory, that would mean one to each six square yards, which is pretty close to the limit of capacity through the breeding season. To say, therefore, that 50,000 seals come to these Rocks is a gross over-statement of the position.

At times other than the breeding season the Rocks are only occupied by a small number of seals, which seem to come here purely for resting purposes.

About the beginning of November the large males (or bulls) arrive at the Rocks and take up a definite territory, which they retain until about the end of January. During this period they seldom if ever leave the Rocks to feed, so that while they are very fat and in good condition when they arrive, at the end of the season they are very poor. As the females arrive the bulls each endeavour to secure a harem. The single young one produced by each female is born about the end of November, and from then on for the next few weeks pandemonium reigns—with the bellowing of the males and the noise made by the females and the bleating of the young ones there is a constant uproar both day and night.

A good deal of fighting takes places amongst the males owing to others trespassing on their territory; but rarely do they kill each other, because before the fight reaches a serious stage one will have had enough of it and clear out. On one occasion I saw a bull lap up sea-water like a dog after a fight.

For the first few days after they are born the young ones lie about sleepily on the rocks, but as they get older they play about in the many rock-pools, being later taken to sea by their mothers, who in the early stages are very solicitous of their welfare.

Many fishermen have claimed that when seals get amongst a shoal of fish they are exceedingly destructive, in that they kill fish for sport. To a casual observer this would appear to be so, because a seal has no teeth capable of biting or cutting fish into pieces. If he catches a fish that is too large to swallow in one piece he must break it up. A seal's teeth are designed only for securing and retaining such slippery prey as fish, so that when a seal gets a large fish he grips it tightly in his teeth, shakes his head violently, and breaks off a piece, which is promptly swallowed.

The other broken piece, of course, flies away, giving the impression that the seals are tossing the fish into the air in sport. If fish are not abundant at the time, the seal goes after the broken piece, but if food is plentiful he would naturally get the closest fish and repeat the performance. There is no evidence whatsoever that seals kill fish for sport, or for any reason other than to obtain food.

Investigation has shown that in Bass Strait our seals feed mainly on the common pelagic fish, such as salmon and barracouta.

The seal being a polygamous animal, there must be a surplus of males every year that cannot secure a harem. In the Alaskan Fishery it is these surplus males of two or three years old that are killed to provide the fur skins for market; but as there is no trade in these skins in Australia the surplus males are driven away from the main part of the rocks by the older and stronger bulls, and I am convinced that it is these seals that are the cause of complaints from fishermen in Port Phillip Bay and Western Port Bay, where occasionally a few of them cause trouble to fishermen. Fishermen have the right to kill all seals interfering with fishing operations.

SPIDERS AND SILVERFISH

Some weeks ago my wife and I saw a "daddy longlegs" spider holding a silverfish, minus feelers and legs, and struggling along the wall with its burden. About a fortnight later in the corner of the wall and ceiling was another "daddy longlegs" and about 15 inches down was hanging a silverfish immobilized by web. I gave this specimen to Mr. Ivo Hammet. Since these two incidents, "daddy longlegs" have been regarded with very much greater sympathy than previously.—N. O. ROSENHAIN.

As mentioned above, Mr. Rosenhain handed me the "immobilized" silverfish and also its captor. Both were in a small glass jar when I received them but, on the following morning the silverfish had disappeared and the spider had doubled its size. The spider in question was the whirling type, with very slender limbs (*Tholcus littoralis*).—IVO C. HAMMET

WHEN SPARROWS WERE SCARCE

"About a week since," says *The Argus* of February 7, 1865, "a small colony of the English house sparrow, consisting of probably three families, or about 20 birds altogether—encamped in the garden and premises of Mr. Manallack, of Brunswick, and still appear perfectly satisfied with their choice. The members of the Acclimatisation Society will be gratified to learn that they could not have fallen into better quarters, for their worthy host carefully guards the 'new chums' from every kind of danger, and attends to their daily wants in a manner that is at once pleasing and creditable."

Readers are requested to note that in the Index issued with the May number of *The Victorian Naturalist* the volume number should be LVIII.

Plate III

The "Batman" Apple Tree at Greensborough.

Photos. by E. E. Pescott.

THE "BATMAN" APPLE TREE AT GREENSBOROUGH

By EDWARD E. PESCOTT, Melbourne

So the "Batman" tree has been "discovered" again!

The tree crops up periodically in different ways, and there are many legends concerning it. It was planted by John Batman; it was brought from Tasmania by Batman; it was planted as a memorial to Batman (a) in his memory, or (b) as a memorial to his famous meeting with the aborigines. These are some of the legends. Further, quite a number of people are credited with the direct planting of the tree.

The old tree, weary and worn, much dilapidated, stands on a flat on the eastern bank of the Plenty River, a few miles above Greensborough, and quite close to the water-supply pipe that crosses the valley and the river.

The facts about the tree, as far as can ever be known, are these: The original owner or lessee of the land was Frederick Nevin Flintoff, who settled there in the early '40's. Flintoff was a personal friend of John Batman; and less than ten years ago, in 1933, Flintoff's daughter, then a very old lady, and since dead, told me the story of the tree so far as she remembered it. (The Flintoff family are all buried in the St. Helena cemetery.)

The story was that Flintoff ordered his "baliff," one Batey, to plant the tree as a memorial to his friend Batman. This Batey was the father of Isaac Batey, so well known in Victorian history, and especially of Gisborne.

Some few years later the land came in the possession of Robert Whatmough (pronounced Whatmore), and Flintoff urged Whatmough to guard and protect the tree, and not allow it to be destroyed. This Robert Whatmough claimed to be the first official lamplighter of Melbourne, going out each evening carrying his ladder to light the few lamps then in existence. Later he removed to Greensborough. His son, Robert Emmett Whatmough, succeeded to the orchard, and the tradition of the tree was passed on to him by his father.

Again, in 1910, one Bosch, a German who had succeeded to the orchard, showed me the tree, calling it "the Batman tree." It was in a very parlous condition, and I urged him to graft it over with strong-growing varieties, and also to fill up the crevices in the trunk with cement. These things he did.

So that, up to 1910, we see that no one claimed that John Batman had any connection with the apple tree itself, and therefore this pretension, which must be quite wrong, is only of recent date. At any rate, Miss Flintoff told me that the tree had been planted after Batman's death, and so "that's that."

That the tree came from Tasmania is very doubtful, for it was a seedling tree. When it fruited, Robert Emmett Whatmough exhibited the fruit at the Horticultural Society of Victoria, later the "Royal," and received a certificate for it under the name of "Whatmough's Fancy." Whatmough had a number of wax models of the apple made, and he claimed it to be the first seedling raised in Victoria. He was photographed with his dish of apples, and then the apples were exhibited at the Bourke Street Waxworks, where they were to be seen for some years.

Bosch grafted the tree over with the Rome Beauty and Rymer apples, and also repaired the trunk. But to-day the tree is urgently in need of further repairs.

There is yet another tradition regarding this old apple tree. The hill above the flat, and on which Frederick Flintoff built his house, was called by him "Point Look Out." For many years there has existed a local tradition that this hill was the regular meeting-place of the aborigines. Now, the exact location of the signing of the famous Batman treaty with the Jaga Jaga group has always been a matter of much controversy. In 1885, James Blackburn, C.E., dismissed all prior authorities, by fixing the place of meeting "on the east side of the River Plenty, to the N.W. of the township of Eltham, and about three miles above the junction of the Plenty with the River Yarra." Such a location may with some certainty be the spot on the banks of the Plenty, above Greensborough, quite close to where the water-mains cross the river. And so local folk have said that the tree was planted by Flintoff to commemorate this meeting. If Batman did meet Jaga Jaga here, then the tree assumes a most important place in our history.

But then, in later years, A. S. Kenyon and others have stated that, with all of his impedimenta, Batman could not possibly have taken such a long walk in the time allotted to him in his diary. They have decided that the banks of the Merri Creek near Northcote was the place of the famous meeting. And so our visions of the importance of the tree fade away.

But whatever Flintoff intended, there is the tree, certainly planted as a memorial of some kind to his friend Batman. There it stands to-day, after a century, battered and forlorn, but living, and appealing.

An interesting association with the tree are the graves of two or three little children of the Whatmough family, children who died in the very early days. The graves, unmarked, are near the pipe-line, and indeed, the Whatmough family have stated that the survey of the pipe-line was altered so that, in the building of it, the graves should not be disturbed.

BOTANICAL PARADISE OR CATTLE-RUN?

By H. C. E. STEWART, Melbourne.

Twenty-two days at Mount Buffalo during February and March last provided occasion for a survey of the grazing position there and its effect on the indigenous flora. Misgiving was felt from the outset at the probable aftermath of the tremendous destruction by the 1939 bush fires. Naturally, the first outcome observed was the prolific growth of alpine grasses. In this can be found the motive for grazing on the highlands. When dry summers occur in the lowlands, the eyes of cattlemen are turned to the green high levels.

Modern conservation principles applied to national parks and reserved primitive areas discard grazing permits as an anachronism. In accord with such principles the Field Naturalists' Club of Victoria and kindred societies protested vigorously, but ineffectually, against a grazing lease on the Buffalo early in 1939. The plea in defence of this lease was that it solved the problem of illegal grazing. True, stray cattle trespassed on the Buffalo during the years prior to the resumption of the lease, but not to an extent to justify the licence being granted. What was seen during the recent summer proves that two kinds of grazing—illegal and otherwise—can flourish side by side.

The first morning, February 15th, the lowing of cattle penetrated indoors, and outside the Chalet several beasts were seen promenading the road by Bent's Lookout. Nibbling at native shrubs, they halted to investigate the concrete-and-granite shelter-cabin newly constructed at Echo Point. As there was nothing to eat in this expensive-looking edifice, they continued their walkabout towards the tennis courts. The animals kept on a vegetarian diet, not strictly confined to *Gramineae*. Identical cattle, a week or so later, evinced a partiality to the exotic shrubs in the Chalet front garden, when the gate was left open overnight.

After breakfast, the urge to inspect the back track past the stables to the nearest tundra was too strong to resist. Seventeen horses contentedly munched chaff, oats and hay in their stalls, and the sight created wonder why cattle were not treated likewise. Leisurely the granite was traversed until the main road at the pump-house was reached. A cow with her half-grown progeny, was seen feasting on the Mountain Heath-Myrtle (*Baeckea Gunniana*), watered down by draughts from the Crystal Brook. The pawed state of the brooksides, with the resultant mire, indicated regular visits. Presently a lusty plant of St. John's Wort caught the eye, unusual for the high altitude. The stoloniferous roots made it difficult to uproot the invader. But how to dispose of the unwelcome remains? The calf seemed interested, so the plant was offered. He sniffed inquiringly, then turned aside to resume the banquet of *Baeckea*. Perhaps he recognized the curse of the north-east, or knew in his animal way that he and his kindred had brought the seed from the valleys.

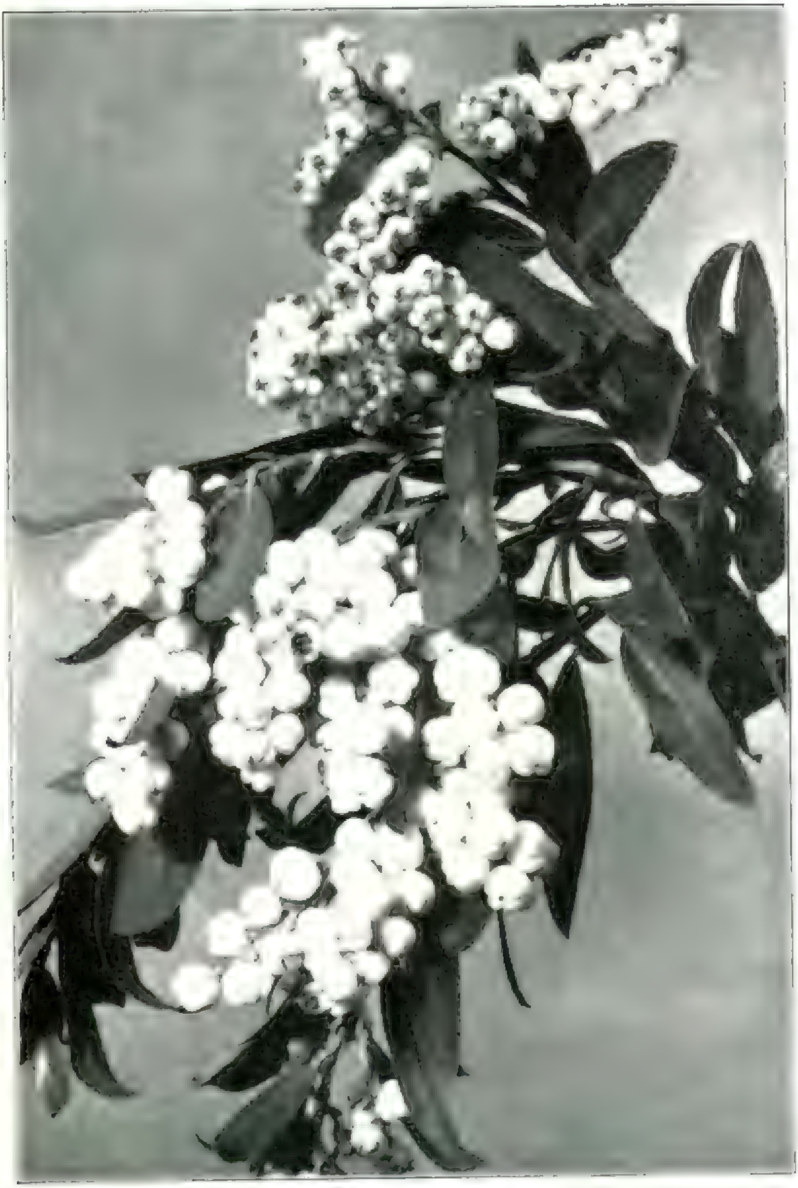
The saunter was continued along the road towards the Hen and Chickens Rocks. There we saw a wide expanse of Alpine Everlasting (*Helichrysum lepidophyllum*) in a glory of bloom, limited entirely to this particular region. Cattle embellished the scene here, too, but evidently the xerophilous everlasting proves too much for their digestion.

In the afternoon Lake Catani was visited. At the head of the lake an imposing herd of cows browsed, presided over by an enormous black-and-white bull. Subsequently the bull, a well-known feature of the landscape, was found to be the influence persuading lady visitors to retreat the way they came, when seeking to walk round the lake. Acres of grass had been closely cropped at this favourite haunt of cattle, and numerous flowering plants had been devoured. Here and there were bitten green stubs of native herbaceous perennials, the Golden Everlasting (*Helichrysum bracteatum*), the Alpine Aciphyll (*Aciphylla simplicifolia*), the Silver Daisy (*Celmisia longifolia*), to mention but a few that could be a show of colour at the time of year—but now not a specimen was in flower.

At the camping-ground, additional cattle rested in the lee of the new community hut, a replica of the Echo Point building. The state of the ground nearby would hardly entice hygienic campers to use the shelter. Some venturesome heifers waded in the lake betimes, to find new vitamins in the water reeds.

An excursion to Mount Dunn, via the Long Plain, formerly a joy in the floral season (dilated upon by the late Dr. J. F. Wilkinson in his *Romance of Buffalo*) revealed further encroachments by the cattle. The shores of the lake and the boggy margins showed not a square yard without hoofmarks, and the hygrophilous flora was seriously denuded. Nearer the Horn Road, the Mountain Heath-Myrtle was again despoiled, and considerable impoverishment was manifest in the wonderful Daisy bushes and Mint bushes. A rock in the locality shelters the lone example of the Tree-Violet (*Hymenanthera angustifolia*), a drug plant whose properties are being investigated in medical research. Shorn of its outer foliage by cow teeth, this bush shrank further beneath the granite. Plants disagreeable to the cattle palate, like the peerless epacrid *Richea continentis*, mutely expressed resentment of animal hooves and droppings. Cow manure may stimulate pansies in suburban gardens, but is poison to many native plants, especially rarified montanes.

PLATE IV



The "Waxberry" (*Gaultheria appressa*).

Photo. by H. T. Reeves.

Desolation caused by the forest fires along the next mile was most grievous. Erosion of the inclined track was assisted by the comings and goings of cattle. The way was the well-trodden link for animals, connecting the Reservoir Valley and the Long Plain. Consolation was sought in trying to find signs of regeneration after the fires. *Gaultheria appressa* ("Waxberry"), Victoria's choicest fruiting shrub, and one of the only two representatives of *Ericaceae* in the State, originally abounded along this track. No seedlings have appeared, and bushes not entirely burnt have vainly tried coppice growth, which was soon discovered by the enterprising cows. The "Waxberry" of the illustration grew in a steep ravine in another part of the mountain, inaccessible to cattle.

Burnt-out forest areas were seen opened up for the easy access of four-legged vandals that nibble at the arboreal seedlings springing up in thousands. Even baby plants of *Eucalyptus Mitchelliana*, the rare Buffalo Weeping Gum, were found uprooted or trampled upon, if not eaten. Surely every encouragement should be given to guard the new growth, which on account of the sparse soil and climatic conditions is extremely slow.

What prevailed near the Chalet obtained to a worse degree in the distant parts. The Crystal Brook vegetation, a marvellous example of the development of a homogeneous alpine flora, as well as an aesthetic delight at flower-time, is threatened with extinction. The natural relationship of plants in the snow-grass tundras and along the watercourse is upset by the gradual decimation of such species as the Long Podolepis (*Podolepis longipedata*) or Dr. Sutton's Orchid (*Prasophyllum Suttonii*), the latter exclusive to Mount Buffalo, and by the ascendancy of the Mountain Gentian (*Gentiana diemensis*), a perennial with drug properties. Cattle avoid the poisonous Gentian, consequently it had blossomed and seeded copiously in the tufts of grass. Below the reservoir the only example on the Plateau known to flower in recent years of the Alpine Bottle-brush (*Callistemon Sieberi*) had been heavily pruned back by bullock greediness. Seed was sought from the bush for propagation. (For illustration of the plant in flower see *Vict. Nat.*, Vol. LVI, No. 11, page 182.)

Above the weir the spectacle of three bullocks wallowing in the moist fringes of the Reservoir (*inside* the barbed wire enclosure) aroused suspicions regarding the purity of the Chalet water supply. The hoof tracks all around the margin of the water indicated the beasts had been there for several days. And yet the notice board prominently displayed forbade swimming, boating, skating, and fishing to mere humanity! Mention of this incident on return to the Chalet elicited the information that neither the ranger nor his assistant had horses to police the park. In the small disused horse enclosure at the ranger's cottage the Long Podolepis blossomed. Outside, on the wide cattle-ridden spaces, the plants were present but beheaded of their tall golden inflorescences.

The once glorious slopes of *Eucalyptus gigantea*, the Red Mountain Ash, seriously depleted by flame (and also by the wood-chopper), were now thwarted in regeneration. "A very valuable tree," to quote Professor A. J. Ewart's *Handbook of Forest Trees*, "of rapid growth, and seeds freely; although superior to messmate (*E. obliqua*) for timber, the tree is less resistant to fire and injurious agencies excepting frost and snowfalls; but is less easily killed by fire than *E. regnans*, and re-afforests readily by seedlings if protected."

A whole day was devoted to a ride to Goldie's Spur, along the track by which the Plateau was ascended from the Buckland in the early days. On the return journey, just near where the branch track leaves the new road, a mob of at least sixty bullocks were encountered, all with heads turned to the high elevations. The damage observed in the vicinity can be guessed by those concerned with forest conservation.

What is the attitude of visitors to the Buffalo and the authorities responsible for its control? Guests generally condemn the grazing and the Railways Chalet administration admit dislike of the cattle, especially on the nearer areas, as their presence depreciates the tourists' attractions. The management committee of the Park, a separate authority from the Railways Department, also seems to be unhappy over the agistment question. Except for an occasional dilapidated fence in the Crystal Brook valley and barriers against motorists, the Park is unfenced, and, as already indicated, cattle find it easy to reach the Plateau. To police the whole Park effectively is therefore difficult. The problem is accentuated at the present time by lack of funds and of man-power. To rely on the lessee to keep the whole area free from stray cattle, and his own cattle under control, has proved wishful thinking. In a 23-years knowledge of the Buffalo, the number of cattle noted on this last visit was a record, and their destructive effects were never before so apparent.

Is there to be a tragic repetition on the magnificent Buffalo of the fate through fires and grazing that has befallen Wilson's Promontory? The cattle, in the interests of their own welfare, will be taken off the mountain before winter sets in. Are we to sit and bemoan the devastation that will be resumed when next summer comes round?

A NEW SPECIES OF *CYATHEA*

By N. A. WAKEFIELD, Genoa, Victoria.

Cyathea marcescens sp. nov. Planta plerumque 6-9 m. alta; caudex crassus sæpe totaliter marcidis frondibus pendentibus celatus; frondium bases robustæ nigræ lævissimæ papulosæ squamosæ erectæ persistentissimæ; squamæ fuscissimæ integræ alatæ fulgentes earum bases ovatæ apices filiformes; rachises farinosæ supra infra exigue tuberculatæ; pinnæ secundariæ pinnatæ vel pinnatifidæ squamis mollibus infra; pinnulæ glabræ lobatæ ferentes multos soros biseriatos; sori nudi; involucrum parvum planum secretum.

Distribution: South-East Australia (Croajingolong).

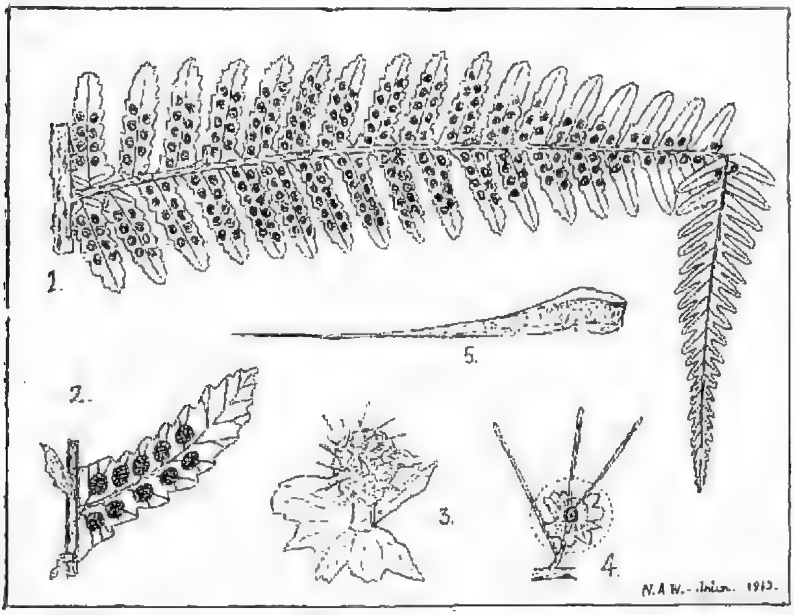
Trunk up to 30 ft. high and 1 ft. thick, normally clothed right to the base with hanging masses of dead fronds; frond butts thick, black, shiny, pimpled, scaly, erect, persistent; basal scales dark brown, shiny, broad, long, entire, somewhat winged, tips filiform; fronds up to 20 ft. long and 5 ft. broad, dark green, somewhat flaccid, thrice pinnate; rachises sparsely pimpled and clothed with a somewhat deciduous mealy vestiture below; secondary pinnae about 5 in. long, lower part pinnate, pinnatifid above, with small soft scales on the midribs; ultimate pinnules over ½ in. long and ⅛ in. broad, stalked to adnate, conspicuously lobed with often the basal lobes larger, when fertile bearing up to 14 sori in two rows, one sorus on each lobe on the upper arm of a forked vein; sori subtended by small, irregular, flat, incomplete indusia; receptacle stalked, spherical and bearing weak entire hair-like scales between the sporangia.

Localities: Mount Drummer (Karlo Creek and "The Spring"), February, 1941; and Combienbar (Bungywarr Creek), August, 1941; N. A. Wakefield.

"Giant Treefern" would be a suitable vernacular name for *C. marcescens*, for not only does the crown of fronds often develop to an enormous size, but the hanging dead fronds may form a dense mass over 20 feet high and several feet in diameter, giving the fern a truly remarkable appearance.

The new treefern was first noted by Mr. Frank Robbins, who was the first botanist to explore the Mount Drummer area to any extent. Mr. Robbins noted two unusual treeferns below "The Spring" and one was identified as *Cyathea Cunninghamii*, but as no fertile specimens were collected from the other, its identity remained unknown until early in 1941, when the author investigated it and found it to be a species unknown to science.

Cyathea marcescens belongs to a group of species which previously constituted the genus *Hemitelia*, which along with the former genus *Alsophila* is now combined with *Cyathea*. Four



Cyathea marcescens, sp. nov.

Fig. 1 Under-side of secondary pinna and part of primary rachis (natural size).
Fig. 2 Under-side of pinnule (tertiary pinna) (twice natural size).
Fig. 3. Involucre and receptacle (much enlarged).
Fig. 4. Involucre in position on vein; with comparative size of sorus and receptacle indicated (much enlarged).
Fig. 5 Typical scale from frond-butt (natural size).

members of the present genus are known from Victoria—*Cyathea Leichhardtiana* (F. Muell.) Copel., *C. Cunninghamii* Hk.f., *C. australis* (R.Br.) Domin. and *C. marcescens*. There is no authentic Australian or Tasmanian record of *C. medullaris*, our records having been based on wrongly determined plants of *C. Cunninghamii*.

The Slender Treefern (*C. Cunninghamii*) is found in several places in East Gippsland (Youngs Cr., Orbost; Gungwarr Cr.; and Mount Drummer); and the Rough Treefern (*C. australis*) and Soft Treefern (*Dicksonia antarctica*) are common and abundant throughout the district. The Prickly Treefern (*C. Leichhardtiana*) is very abundant in most of the "jungles" of the Mount Drummer area, but is not known from elsewhere in Victoria. In several places about Mount Drummer the five Victorian treeferns can be seen growing together.

ALPINE FLORA OF NEW ZEALAND

By NOEL LOTHIAN, Melbourne

(*Summary of address to May meeting of F.N.C.*)

Floras of Australia and New Zealand have only one character in common, i.e., the high percentage of endemic forms; otherwise, despite their proximity, these two countries possess totally distinct floras. And nowhere is the differences between these floras more emphasized than in those of the alpine regions.

Australia, whilst possessing a rich and varied flora, approximating 15,000 species probably cannot claim more than five per cent. of this number to be alpine. New Zealand, on the other hand, with a total of some 1,800 species, can show that over 50 per cent. are alpines, i.e., found only over 2,500 ft. This high percentage of alpines is not so surprising when we remember that nearly half of the South Island is over that height. The majority of the ranges and spurs which go to make up the Southern Alps are usually from 5,000-6,000 ft., whilst peaks over this figure and up to 10,000 ft. are by no means rare.

Not only are high altitudes common to the South Island, but also the latitudes are low; these produce the two environmental forces capable of forming a flora which can withstand the severity of climate. Such a flora is called "Alpine," "Arctic," or "Antarctic."

As most of my time was spent in the South Island, the following remarks refer only to this region.

From the grasslands of the plain we change quickly into beech forest, which descends to nearly sea-level in places, whilst it is not uncommon elsewhere at 4,000 ft. When beech is pure the dense canopy nearly prohibits the growth of smaller herbs, but when broken or mixed many plants and ferns make their appearance. In some parts of the island (Otira, Westland) instead of the typical beech forest, one of New Zealand's most beautiful flowering trees takes its place. Probably rivalling the Rhododendron forests of the Himalayas, the New Zealand Rata (*Metrosideros lucida*) gives a scarlet display beginning in December at low levels and proceeds to climb mountain sides until it fails to withstand the rigours of the weather at 3,500 ft. In this district it is not impossible to see hundreds of acres flowering at one time, extending for 500 to 1,000 ft. up the side of mountains. It probably ranks as one of the largest forest displays by a single species to be seen anywhere.

Mountain shrubs make it almost impossible to force a track, and as the sub-alpine scrub is from 2,500 to 4,000 ft., the difficulty in reaching the higher levels is often considerable. It is in this region we first meet the magnificent *Ranunculus Lyallii*, with its pure white flowers up to two and a half inches in diameter, and its peltate saucer-shaped leaves, so that once seen it is never forgotten. Standing two to three feet high it is common along the sides of sub-alpine and alpine lakes, streams and waterfalls in open areas between 2,500 and 4,500 ft. levels.

At similar levels, although rarely associating with the above, *Celmisia coriacea*, "the finest daisy in the world," can be seen. Words fail to express the excitement caused when, by surmounting an obstacle, ten to fifteen plants will come into view. On long stalks, which are covered with woolly tomentum, its huge white flowers stand out from the surrounding foliage, and with its large silver-frosted leaves, one forgets the trouble experienced in reaching this plant. *Celmisia gracilenta*—a near relative to our own *C. longifolia*—*C. petiolata* and one or two other species are to be seen, but when one finally arrives on to the meadows and rock-ledges above, the wealth in species of this genus eclipses all others.

One of the most interesting sub-sections of this region is to be found along the margins of ponds and lakes, which support a vegetation peculiarly their own. Another ecological group is found in the plants which inhabit river and creek beds, shingle fans and margins of moraines, usually between 2,000 and 4,500 ft. Plants inhabiting river beds are nearly all dwarf-growing herbs, cushion or mat plants, with one or two shrubs scattered at irregular intervals.

Shingle plants always overlie clay soil on steep slopes and support certain peculiar plants which have become so adapted to this habitat that they are unsuited to any other. All have a tenacity for life, which can be best illustrated by the long, penetrating root systems, not to be found in any other plants of the same size. *Ranunculus Haastii*, which could be taken as the type for the shingle slip plants, possesses in addition to its large rhizome thick fleshy roots which often penetrate upgrade for a distance of three feet or more.

In alpine fell field, grassland or meadows—4,000 to 6,000 ft.—one finds the wealth of New Zealand's alpine flora. Veronicas, Drapetes, Pimelea, Celmisia, Gentians, Senecio, Ourisia, Anisotome, Aciphylla, as well as Poa, Danthonias, Luzula, Carex, ferns and fern allies, are all present in more or less quantity. Celmisias are in numbers, usually favouring open situations.

High alpine plants—6,000 ft. to perpetual snow—despite the action of high winds and snow which makes plant life difficult, constitute quite a rich flora. Nearly all are cushion-like in form, while many of the shrubs which may be erect in lower regions or more congenial situations here assume a complete prostrate habit. From crevices and rock faces grow those peculiar forms of Raoulia (*R. eximia*), more commonly known as "vegetable sheep." Until quite close the resemblance is remarkable. To a lesser degree *R. mammillaris* and *R. bryoides* assume this form. *Veronica pulvinaris*, *Hectorella caespitosa*, *Phyllachne Colensoi*, and *Colobanthus acicularis* all make cushions one to three inches high, and form a great part of the flora at this altitude.

On screes and basins below very high ridges several remarkable plants grow. *Haastia Sinclairii*, with its foliage covered by a woolly tomentum, is perhaps the most unusual. *Veronica Haastii*, *Dracophyllum Kirkii* and *Pimelea prostratum* all manage to obtain a living under such severe conditions. Many can be found inhabiting varied situations, e.g. *Veronica Haastii*, *Dracophyllum Kirkii* and *Blechnum penna-marina*, which not only grow in screes and alpine meadows, but also in crevices and rock ledges at altitudes between 8,000 to 9,000 feet.

By the cultivation of alpines one usually means European and Asiatic plants, but it is hoped that one day we will follow N.Z.'s lead and grow our own alpines at lower levels for the benefit of those who are unable to climb and who would like the pleasure of seeing them in their natural state.

VALUE OF "MANNA"

Is there any therapeutic value in "Manna," the sweet exudation of some species of our Eucalypts? Manna, which fell from the trees in the form of a white pellet, was readily sought for and eaten with relish when I was a child. The discharge of Manna from our gum trees is due to an injury to them and is akin to the exudation of the sap of the rubber trees of commerce, which is induced to flow by the deliberate cutting of the bark in a scientific manner so as not to destroy the tree. In Canada a sweet syrup is obtained from the maple-tree for eating purposes. Can such be obtained from some species of our Eucalypts?

ARTHUR H. E. MATTINGLEY.

CORRECTION

Under exhibits shown by Mrs. Freame, as listed in the last issue of the *Victorian Naturalist*, it would seem that a series of coloured sea-anemones were exhibited when actually all the colours as listed were in the one specimen, an unusual happening and well worthy of being noted

The Victorian Naturalist

Vol. LIX.—No. 3 July 8, 1942 No. 703

PROCEEDINGS

The Annual Meeting of the Club was held on Monday, June 8, 1942. The President, Mr. P. Crosbie Morrison, presided and about 80 members and friends attended.

CORRESPONDENCE

(a) Letter from Mr. T. A. Robinson, of Dutson, Sale, thanking members for good wishes sent on his 90th birthday.

(b) Mr. Melbourne Ward, "Pasadena," Cross St., Double Bay, Sydney, stating that he desired to obtain native Australian and South Sea Islands weapons, etc. Members interested can write direct.

NEW MEMBERS

The following new members were elected: As ordinary members, Miss Ina Watson, Miss F. O. M. Curnow, and Mr. G. A. J. Parrett; as country members, Messrs. C. Beaglehole and William Perry.

REPORTS ON EXCURSIONS

Reports of excursions were given as follows: Studley Park, Mr. F. S. Colliver (for Mr. A. C. Frostick); Botanic Gardens, Mr. H. C. E. Stewart.

ANNUAL REPORT AND BALANCE SHEET

The annual report was presented by the hon. secretary and was duly adopted. The balance sheet was read by Mr. A. S. Chalk (auditor) and was adopted after discussion.

ELECTION OF OFFICE-BEARERS

In a ballot, Messrs. H. C. E. Stewart and Ivo C. Hammett were elected as vice-presidents.

The following were elected without opposition: President, Mr. P. Crosbie Morrison; hon. editor, Mr. A. H. Chisholm; hon. secretary, Mr. F. S. Colliver; hon. assistant secretary, Mr. Noel Lothian; hon. treasurer, Mr. E. E. Lord; hon. librarian, Dr. C. S. Sutton; hon. assistant librarian, Mr. P. Bibby.

An election for the committee was necessary and the ballot returned Messrs. A. S. Chalk, G. N. Hyam, J. H. Willis, P. F. Morris, and H. P. Dickins.

GENERAL BUSINESS

(a) Forthcoming Excursions.—These were spoken to by their respective leaders.

(b) Thanks to Retiring Officers.—The President referred to the past services of Messrs. G. Coghill, J. and W. H. Ingram, and S. R. Mitchell, who have found it impossible to carry on in office. He mentioned that Mr. Coghill had been in various official positions for approximately 48 years. The President also paid tribute to the work of Messrs. L. W. Cooper and G. N. Hyam.

NATURE NOTES

Miss Florence Smith reported on the numbers of Silver Gulls in public gardens. Mr. P. F. Morris stated they were feeding on the grass grubs that are very common at present.

Mr. R. Lee reported that a Pallid Cuckoo was heard in his district on Sunday, June 7.

Mr. F. Salau reported that a Koala had recently been seen at Clarinda.

PRESIDENTIAL ADDRESS

Speaking under the title "Escape to Reality," the President said that in these times everyone needed rest for the mind at intervals, and suggested that one of the best means of "escape" was an interest in natural history. In his own case this had taken the form of experiments in photography in natural colours. A series of lantern slides that followed showed how successful these experiments had been. Mr. A. D. Hardy returned the thanks of members to the President for the highly interesting address and illustrations.

EXHIBITS

Master Leslie Woolcock—A series of beetles.

Mr. R. Dodds—Scorpions.

Mr. C. French—Native Fuchsia (*Correa reflexa* var. *rubra*), Coolgardie Gum (*Eucalyptus torquata*), Tea-tree (*Leptospermum scoparium*, double flowers), all garden-grown.

Mr. E. E. Pescott—Collection of polished stone dishes, including agate, Cornish serpentine, and stone inlaid with black marble.

Mr. H. C. E. Stewart—Specimens in flower of *Correa rubra*, *Grevillea rosmarinifolia*, and *Melaleuca nesophila*, from the Baron von Mueller memorial plantation at St. Kilda.

Under Nature Notes in the *Victorian Naturalist* for June it was stated that a cormorant had been seen to eat 71 lbs. of fish each day for a week. The figure, of course, should have been 7 lbs.

SIXTY-SECOND ANNUAL REPORT

The membership is as follows: Life Members, 2; Honorary Members, 16; Ordinary Members, 214; Country Members, 78; Associate Members, 31. This is an increase of 10 on the figures of the last report.

Considering the present circumstances, attendances at the meetings have been well sustained and excellent displays of specimens have been made. In this respect we congratulate Messrs. I. C. Hammett and R. G. Painter on the continued display of garden-grown native plants.

The excursion list this year, owing to further drastic restriction of transport, has been practically confined to localities reached by tram and train; one exception was a week-end excursion to Bendigo, where a number of club members took part in a night meeting consisting of a series of lecturettes on the natural history of Bendigo.

Volume 58 of the *Victorian Naturalist* has been completed, and here again war-time restrictions have been felt; a limit to the size of the journal is still in operation. Nevertheless many papers of scientific value and popular interest have been published. That the journal continues to hold its place in scientific literature is proved by additional requests for exchange.

War conditions have prevented matters affecting better protection of flora and fauna from being followed up as we would wish, but the following matters have been enquired into and information passed on to the authorities concerned: Cleaning up of Sherbrooke Forest, placing of koalas in Ararat Park, proposed slaughter of seals, grazing at Mt. Buffalo National Park, and the proposed preservation of an old apple tree at Greensborough. We record with pleasure that the "Bell Rock," an unusual outcrop of quartz at St. Arnaud, has been proclaimed a "reserve."

Further assistance in connection with an exhibition of natural history photographs in South Africa has been asked for during the year, and we have as usual assisted kindred societies where possible. The Emily McPherson College of Domestic Science asked for assistance by lectures; the C.S.I.R. asked for drug plants to be collected; and we co-operated with the Brighton Council in matters pertaining to tea-tree along the foreshore. We are still in co-operation with the Department of Information, and expect to continue throughout the duration. More than usual, members individually have given lectures to various bodies and particularly to groups from the fighting forces.

Our assistance in determining by vote a flower to be used as Victoria's Floral Emblem was sought by the National Herbarium, and a ballot for this purpose was held. Opportunity for every member to vote was given and the result showed the flower of our Club badge, *Correa rubra,* to be first choice. The Common Heath (*Epacris impressa*) and Blue Pincushion (*Brunonia australis*) polled second and third in order.

Business relating to the Australian Natural History Medallion is still in the hands of the Club. The recipient of the last award was Mr. F. Chapman, a valued member of the Club and one of world fame for his researches in palaeontology. Presentation of the medallion was made by Sir Frederick Mann at the August meeting of the Club and representatives of most of the allied societies were present.

From time to time we have heard from members at present in the fighting forces, and on occasions we have been pleased to welcome to our meetings members home on leave.

The annual Wild Nature Show was not held this year, but in its place a Wild Flower Show was staged. Displays, mainly cultivated, and one of material collected during the Bendigo excursion, filled the Victorian Horticultural Society's Hall.

Owing to an illness of the hon. secretary, Mr. Noel Lothian was asked to act as secretary and he filled the position in a very satisfactory manner for six months.

The *Fungi Book*, by J. H. Willis, was duly published and favourably received. A large number has been sold and the remaining stocks form a valuable addition to the Club's property. During this year it was found necessary to increase the price of the *Fern Book* to 2/-, and a considerable number has been sold to the book trade for disposal at the new price.

To bring the Club's work before a greater number of young people in Melbourne, the committee has been considering the formation of junior branches, and at present the possibility of such a branch being launched at Hawthorn is being discussed. Another innovation to assist junior members was the appointment of a junior leader on each excursion, and this seems to be very popular.

During the year the Club received the offer of some property in the Sale district and the committee is at present considering what would be best to do in the matter. Owing to legal difficulties were are unable to own such a property, and we hope to find some means whereby the native garden concerned can be preserved.

During the year we have welcomed to our meetings overseas naturalists and members of interstate clubs, and have been pleased to see some of our own country members from time to time.

A comprehensive expression of thanks is extended to all members and friends who have helped to advance the Club and its activities.

FIELD NATURALISTS' CLUB OF VICTORIA

BALANCE SHEET ON 30th APRIL, 1942.

LIABILITIES	£	s.	d.
Late Dudley Best Fund	£50	0	0
Subscriptions paid in advance	21	5	7
Special Trust Account (in Savings Bank)	12	15	3
E.S. & A. Bank Overdraft	29	0	6
	£113	1	4
Balance, being surplus of Assets over Liabilities	1,410	1	8
	£1,523	3	0

ASSETS	£	s.	d.	£	s.	d.
Arrears of Subscriptions—£90 Estimated to realize				£25	0	0
State Savings Bank—						
General Account	£260	7	9			
Special Trust Account	12	15	3			
				273	3	0
Investments—						
E.S. & A. Bank Fixed Deposit "Best Fund"	£50	0	0			
E.S. & A. Bank, Fixed Deposits	50	0	0			
Commonwealth Bonds — Face value (Market Price on 30/4/42 was £478)	450	0	0			
				550	0	0
Library, Furniture and Epidiascope— At Insurance Value				650	0	0
Stock on hand of Books and Badges— At valuation—						
Fern Book	£23	0	0			
Club Badges	2	0	0			
				25	0	0
				£1,523	3	0

Audited and found correct on 5th June, 1942.

A. S. CHALK, } Hon. Auditors.
A. G. HOOKE, }

JOHN INGRAM, Hon. Treasurer.

FIELD NATURALISTS' CLUB OF VICTORIA

STATEMENT OF RECEIPTS AND EXPENDITURE FOR 12 MONTHS ENDED 30th APRIL, 1942.

RECEIPTS		
Subscriptions—		
Arrears	£32 4 6	
Current	165 5 6	
In advance	21 5 7	
		£218 15 7
Cash Sales of—		
Victorian Naturalist	£3 16 1	
Shell Book	1 6	
Fern Book	26 1 1	
Census of Plants	7 6	
Fungi Book	75 8 7	
Badges	18 0	
		106 12 9
Donations		5 11 0
Advertisements in *Naturalist*		3 0 0
Native Plants Show—Net Proceeds		4 10 6
Interest Received—		
"Best" Fund, Fixed Deposit £50 @ 3%	£1 10 0	
Fixed Deposits	3 8 0	
Commonwealth Loans	23 8 9	
Savings Bank Current Account	5 4 5	
		33 11 2
		£372 1 0

EXPENDITURE			
Balance at Bank on 30th April, 1941—			
E.S. & A. Bank Overdraft	£105 9 9		
Less Savings Bank Credit	81 14 7		
			£23 15 2
Victorian Naturalist—			
Printing	£164 15 0		
Illustrating	59 4 6		
Despatching	6 13 2		
		£230 12 8	
Reprints		4 2 6	
Postage and Freight		8 15 1	
General Printing and Stationery		18 4 7	
Library		12 17 6	
Fungi Book		104 0 0	
Fern Book, cost of over-printing		5 10 0	
Rents—			
Royal Society's Hall	£16 0 0		
Royal Society's Caretaker	1 10 0		
Committee Room	2 15 0		
		20 5 0	

Commonwealth Bonds matured 15th November, 1941	150 0 0	Donations—			
Fixed Deposit, E.S. & A. Bank, matured	150 0 0	Advisory Council for Flora and Fauna	£1 1 0		
		A. & N.-Z. Council for Advancement of Science	10 6		
		Comforts Fund	5 9 5		
				7 0 11	
		General Expenses		3 10 1	
		Interest on Overdraft		2 0 3	
					416 18 7
		Balance at Banks on 30th April, 1942—			
		State Savings Bank Credit		£260 7 9	
		Less E.S. & A. Bank Overdraft		29 0 6	
					231 7 3
	£672 1 0				£672 1 0

Audited and found correct on 5th June, 1942.

A. S. CHALK, } Hon. Auditors.
A. G. HOOKE, }

JOHN INGRAM, Hon. Treasurer.

ESCAPE TO REALITY

A nature talk for war-time, delivered as Presidential Address to F.N.C., June 8, 1942.

By P. CROSBIE MORRISON, M.Sc.

Psychologists have established a definite relation between mental stress and apparently irrelevant activities. The business man who loses himself and his worries momentarily by spending a night at the theatre; the over-wrought individual who drowns his consciousness in alcohol; the little scullery-maid who brings a tattered novel from under her apron and identifies herself for a few spare minutes with the poor little heroine who is destined to marry the handsome young peer in disguise—they are all doing the same thing, really. They are obeying the instinct of psychological escape. They are transporting themselves for a time into the world of make-believe where, if dreams do not actually come true, there are at least none of the nightmares that form part of the everyday life of so many of us. The psychologists not only recognize the existence of this habit of mental escape; they declare it to be a necessary part of the intellectual life of any human being who is required to bear prolonged mental strain of any kind—anxiety, planning, worry, or even boredom; it is the mental equivalent of a physical holiday.

Granted an occasional escape, the mind retains its keenness. It is able to arrange things in their proper perspective. It is able to bear anxieties and worries with fortitude. It enables us to "meet with triumph and disaster, and treat those two impostors just the same." Without it, the mind quickly reaches breaking-point. To seek such an escape is not an act of mental cowardice; it is, rather, the rational act of a person who is determined to face things with his mind kept as fit as possible.

Now the types of escape I have mentioned are of a very common type. They are obvious—almost too obvious. They represent an escape from the real to the unreal, and that means that sooner or later we must come back again with a bump, to realities. But there are types of escape which have not this disadvantage, and it is of one of those that I want particularly to speak to-night. Many of you will remember a remarkable address given by the Vice-Chancellor of the University (Mr. J. D. G. Medley) at the jubilee meeting of the Club, in which he said: "You naturalists are to be congratulated in your choice of a hobby. The things that most of us are engaged in are subject to change and shock; no one knows where they are going to lead us, or what will be left when it is all over. But one thing is certain. When it is all over, the flowers will still bloom . . . the birds will still sing . . .

the bees will still be carrying on their successful experiments in communism. The things in which you are interested, and to which you are devoting yourselves, are the things that are permanent, and the things that are real . . ."

Those words were spoken when the world was under the shadow of war. And now the war is in the middle of us. There can be scarcely a home in Australia that is not directly represented in it. The newspaper headlines shriek it at us twice a day. The radio blares it at us in our homes, and if we go out into the street to get away from it we are harangued for miles through bunches of loud-speakers on street corners, and they even put the wretched things on motor cars and chase us down the road with them, until we feel we must go mad. The things that we had lived for are being broken; beauty is replaced on every hand by ugliness. The stark reality of the day has got us in its grip.

And then we look for our escape. The pictures? They are no longer satisfying. Their drama is too unreal, unless it is of war, and then it is too real. The theatre? It seems to have become tawdry, and out of place. A drive into the country? Petrol restrictions have put that out of the question.

But in every suburban garden, however humble it may be; in the city parklands (and every suburb has its park); even in the stones of the gutters of the meanest neighbourhood, there is teeming life waiting to be observed, and studied, and enjoyed. Here, then, is our escape. A man with a modest garden might easily find within its boundaries enough of nature, both plant and animal, to occupy the whole of a life's span without knowing and understanding it all. As you come to know it better you become more absorbed in it, lose yourself in it, and so achieve your escape.

The pictures which will follow, then, are a few samples out of a naturalist's bag to illustrate how varied our choice may be in this vast field of reality. Incidentally, they will serve to fill one of the requirements of a presidential address—that the president should give some account of himself in the field of specialty which he has chosen. My chosen field for a hobby has been to record by color photography as many as possible of the natural history objects of the Victorian seashore, town, and countryside, and in that respect, too, these pictures are submitted as samples.

(At this stage a number of natural colour transparencies were projected on the screen and commented on briefly by the speaker. They comprised examples from shore and marine life, botany, entomology, birds, and mammals of Victoria.)

These, then, with the stories that they can tell us, are the escape for us—an escape, not *from* reality, but *to* a deeper reality in comparison with which the worries of the day and the year are shown in their true light as transitory things.

NOTES ON THE GREAT BROWN STICK-INSECT

By EDITH COLEMAN, Blackburn, Victoria.

PART I.—DEVELOPMENT OF EGGS AND YOUNG

In 1932 a large female Stick-insect (Great Brown Phasma), taken at Healesville, was given the freedom of a room in my garden. A branch of eucalypt, standing in water, apparently filled all her requirements. She grew apace, reaching a length of nine inches.

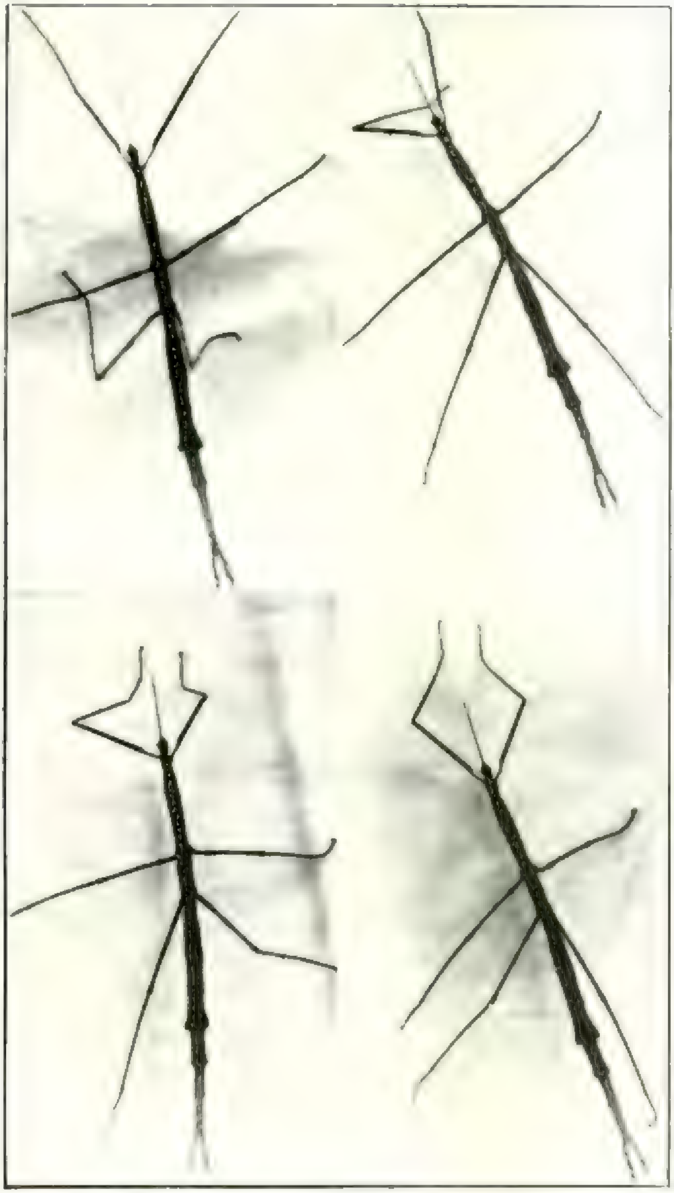
She fed at night, in the daytime resting motionless on the branch. Never once was she found without search; so cleverly had she disposed her limbs that they followed the lines as well as the colour of the twigs to which she clung. I think she not only selected a twig nearly of her own colour, but changed her colour to match the twig. Her camouflage, however, was not proof against spider-cunning. One morning, although doors, windows and fireplace were screened with fly-wire, I found a Huntsman spider with her falces buried in the Stick-insect's abdomen—a meal that lasted for many hours. Considering their relative sizes, it was a prodigious feat, even for an intrepid Huntsman. The insect had apparently left her branch for a wall. Such wanderings occurred only when rain was about, or when a fresh gum-branch was needed.

On January 3rd, 1940, another large female Stick-insect was domesticated here, this time within the house. Her gum-bough stood on the floor in the corner of a large bathroom, a room visited so many times daily that few of her habits should have escaped notice. She, too, fed at night; and at night, like her predecessor, sometimes wandered if the door was left open. She was always discovered resting on wood (architrave or picture-rail) of her own colour. When alarmed, or touched by an inquisitive finger, she rocked from side to side, seeming to realize that a rocking insect was more likely to be taken for a swaying twig than a motionless one. If resting on a rigid surface she remained motionless, except when touched, or when a puff of wind swept through her doorway.

As I had been growing eucalypts from seed, I was able to vary her menu. Messmate (*E. obliqua*), manna gum (*E. viminalis*), and *Prunus* spp. were preferred. Tender young foliage was not essential, although the hard leaves of blue-gum (*E. globulus*), alpine gum (*E. alpina*), and bushy yate (*E. Lehmanni*) were not eaten, nor was the juvenile foliage of blue-gum. Large "bights and bays" eaten on leaf margins were evidence of her well-being.

It was a pleasure to watch at such close quarters her remarkable camouflage attitudes. Usually she rested with her legs so far

Plate V



Camouflage attitudes of the Stick-insect.

Photos.: Edith Coleman.

apart that they resembled tiny branches of a twig, growing in any direction. She would swing, hammock-like, by her two posterior pairs of legs, her forelegs fully extended and parallel, so that her head and tell-tale eyes were completely hidden between them. Viewed from below, it was seen that the inner side of each foreleg was hollowed, like a split quill so that her head was entirely enclosed within the pair of them.

A favourite attitude was with forelegs and enclosed head making one line, the two posterior pairs of legs sloping backward at various angles. She might hold this pose for hours, perfectly rigid, with perhaps only one posterior foot attached to a support. She could move her legs simultaneously in various directions, to simulate a twig, or to look, in the fashion of Kipling's leopard, "like nothing in particular." The lay mind shies at the word "mimicry," suggesting as it sometimes does a conscious imitation; but, watching the Stick-insect dispose her limbs in their twig-like order, one might be forgiven for thinking that here, at least, is an insect which does consciously adopt her protective attitude. Cold science will insist that she is responding to inherited experience: that her attitude, because protective, has been developed and strengthened by slow degrees along evolutionary lines.

On June 1st, 1940, I noticed her wings. I must have missed her two final moults, for I did not see her wing-pads. The wing-buds are certainly very obvious to one who is expecting to see them. On the other hand, they are easily missed by an unpractised eye. The adult wings fit so closely to the body that I should probably have missed these, too, had she not planed to the ground when I was photographing her.

Of many Stick-insects now under observation, only one (male) has at this date (April 28th) passed through its final moult. A few of both sexes have wing-buds. I think it must be assumed that, unless she was more than a year old when captured, the final moults of my Stick-insect took place in captivity. Having eaten her cast skins, she left no obvious evidence.

On July 2nd, 1940, there were two egg-capsules on the sheet of paper beneath her bough. Probably earlier ones were shaken off the paper with excrement, which they rather resemble. From that time until June 10th, 1941, egg-laying proceeded steadily. The eggs were gathered up and placed in a box of humus, although in the circumstances they were not expected to be fertile.

One is perhaps too ready to seize on such biological implications, but, having regard to all the before-mentioned circumstances, and the fact that her eggs have since proved fertile, parthenogenesis is suggested, but not confirmed.

My daily entry of the number of eggs recalled Masefield's story of the grains of wheat—a story without end. On April 2nd, 1941, when newspapers reported that the winner of the Burnley egg-laying competition had created a new record of 340 eggs in twelve months, my Stick-insect had reached a total of 477 eggs in less than nine months—and showed no signs of slowing down. On June 10th the total reached 594 eggs, in less than a year! She probably dropped others on the occasions of her wanderings, and some, no doubt, rolled off the paper and were swept up.

The daily record would make tedious reading. The monthly totals were as follows:—1940: July, 26; August, 13; September, 11; October, 39; November, 55; December, 111; total 255. 1941: January, 87; February, 96; March, 49; April, 41; May, 56; June, 10; total 339.

It seemed a haphazard kind of motherhood compared with the beautiful maternal solicitude of so many creatures; yet how wise a plan it really is! Considering the long period of egg-laying (July, 1940, to June, 1941), during which time the insect would be wandering from branch to branch, from tree to tree, it is obvious that her eggs are not all placed in one basket. A better chance of survival is offered to some, at least, of her great number, which secure suitable conditions.

The egg-capsules, hard and impervious to rain, were the colour of earth and brown leaves on which in normal circumstances they would have dropped, perfectly adapted for survival. They were like tiny, unsymmetrical vases, pitted and carved in curious patterns, each with a tiny lid waiting to be lifted by the emerging insect, too un-egg-like to appeal to egg-eating creatures of any kind.

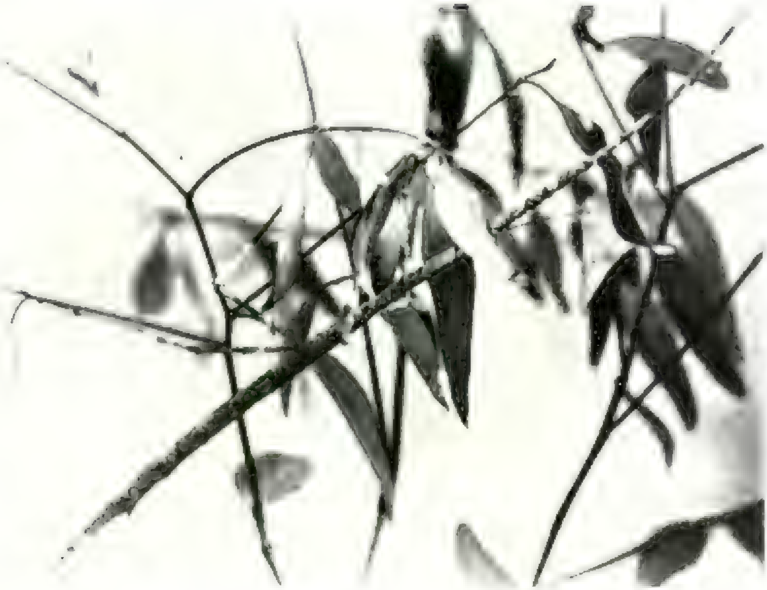
The mother was now rather less active, remaining immobile for longer periods. It was obvious that she was feeling the approach of age. She died on June 18th, eight days after egg-laying ceased, leaving me with a box full of eggs—and a most interesting memory.

NATURAL HISTORY MEDALLION

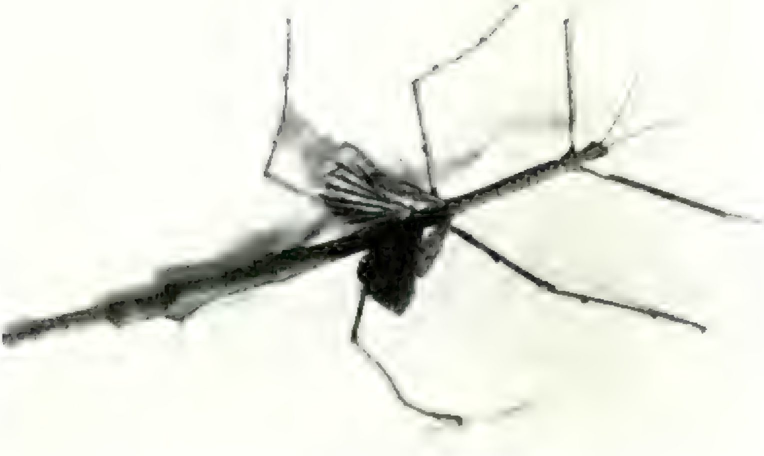
The committee of the F.N.C. has unanimously decided to nominate Mr. David Fleay, Director of the Healesville Sanctuary, for the current Australian Natural History Medallion. Mr. Fleay, a native of Ballarat, is 35 years of age. He began the study of natural history in boyhood and continued it into his days as a teacher on the staff of the Ballarat Grammar School and later in the Education Department. Meanwhile, he gained the degree of B.Sc. and the Diploma of Education, Melbourne University. In 1934 Mr. Fleay left the Education Department to take charge of the Australian section of the Melbourne Zoo, and in 1937 he became Director of the Healesville Sanctuary. In both positions he did highly useful work.

During about twenty years Mr. Fleay has written a great many scientific and popular papers on Australian zoology, mainly relating to expeditions and to research on mammals and birds under his care. Many of these have appeared in the *Victorian Naturalist*.

PLATE VI



Stick-insect camouflage among leafy twigs, leafy appendages at end of abdomen swaying. (Lens set at 1/30th sec. failed to record moving "tail.")



Great Brown Phasma, adult female, wings expanded. These, too small for flight, serve for planing from branch to branch.

Photos.: Edith Coleman.

SYDENHAM INLET IN THE AUTUMN

By (Miss) M. L. Wigan, Melbourne.

After a very dry summer and copious rains in March, a trip to this district, in south-east Gippsland, was full of interest and enjoyment.

The country visited consists of Sydenham Inlet, a lovely sheet of water with low-lying swamp areas surrounding it, except on the southern side, where high sand-dunes divide it from the sea. Westward, these sand-dunes continue, flanked by Banksia and Eucalyptus ridges. Running parallel with and north of these ridges are large treeless plains of grass-trees, interspersed with areas of stunted tea-tree, hakea, and low-growing bushes and plants. Farther inland these give place to thickly-covered hills and valleys, and finally to open forest country.

The Bemm River enters Sydenham Inlet on its northern side and turns eastward on its way to the sea where its entrance to Bass Strait is hindered by a sand-bar. After heavy rain the Bemm River comes down in such volume that it floods the low-lying country of the river's banks north of the Inlet and the waters encroach on the flat country surrounding the Inlet itself, causing considerable damage. The heavy rains in March, although not overflowing the river's banks, had flooded the low country of the Inlet, and on the day of my arrival the sand-bar at the mouth of the river had been cut to release the banked-up waters. Gillawheen, where I stayed, is on the north side of the Inlet, so I was able to watch the waters recede to their normal level, a process which took about 3½ days.

Birds, with the exception of Black Swans, were not numerous, and well away from the land, but gradually Pelicans, Grey Duck, Silver Gulls, and other water-loving birds returned and began to haunt the normal edges of the Inlet as soon as they were exposed. When the waters were fast receding fairly large fish, mostly in shoals, and not far from the edges of the Inlet, were leaping in and out of the water in all directions. The noise they made was truly remarkable. I was told that these fish were poddy mullet.

A visit to the jetty with a torch at night revealed myriads of small fish scattering in all directions. A tiny garfish outnumbered all other kinds. It was possible to catch by hand small fish left in the pools as the water drained away. Yabbies and small crabs were in evidence, and a long-legged or spider crab left high and dry was almost dead when captured.

A few days before the sand-bar was cut some fishermen were near the entrance catching prawns. They reported great numbers of large eels banked up there. The fishermen said the eels were "prawning." I suggest that it is likely that these eels were making their way to their breeding grounds in the sea.

Plant life had responded to the favourable conditions. I was astonished to find so many in bloom. The following are some of the most striking plants seen in flower:

Sunshine Wattle (*Acacia botrycephala*) in showy masses of light creamy flowers, the only species showing bloom being the Sweet Acacia (*A. suaveolens*). *Epacris impressa* was in full bloom, a fine sight in shades of red and pink—no white. Two other species of the Epacridaceæ were Prickly Broomheath (*Monotoca scoparia*) and Rough Beard-heath (*Leucopogon collinus*, var. *ciliatus*); the latter, with reddish stems, dark green leaves, and small white flowers, is a rare eastern variety and was last collected at the Genoa River by H. B. Williamson, 1908. Among the compositae were Grass Daisy (*Brachycome graminea*) and Jersey Cudweed (*Gnaphalium luteoalbum*). Legumes beside the Acacias were represented by Variable Tic-trefoil (*Desmodium varians*), Twining Glycine (*Glycine clandestina*), a small graceful bluish creeper which was making lovely splashes of colour, and the very showy Dusky Coral-Pea (*Kennedya rubicunda*) climbing over the dense flora on the Bemm River banks.

In the family Goodeniaceæ were the Panicled Goodenia (*Goodenia paniculata*) and Fairy Fan-Flower (*Scaevola ramosissima*). Confined to the east, a very beautiful and interesting five-petalled flower in shades of blue and mauve. The Proteaceæ was represented by the Banksia (*Banksia serrata*) and Coast Banksia (*B. integrifolia*); the Rutaceæ by *Boronia muelleri*, on the large bushes of which could be seen a few flowers, but the small plants, some of which were only six inches high, were covered in bloom. Umbilliferae—Shrubby Trachymene (*Trachymene billardieri*) was plentiful; its dark green, rounded foliage and white flowers were a feature of the landscape.

Droseraceæ—Forked Sundew (*Drosera binata*), a very tall variety with a peculiar growing habit. Primulaceæ—Creeping Brookweed (*Samolus repens*). Campanulaceæ—Angled Lobelia (*Lobelia anceps*). Restionaceæ—Slender Twine-rush (*Leptocarpus tenax*), full of bud.

Orchidaceæ—Parsons' Bands (*Eriochilus cucullatus*), and Autumn Bird Orchid (*Chiloglottis reflexa*), named for me by Mr. W. H. Nicholls, who says this species has not previously been collected in this district.

Selaginellaceæ—Swamp Clubmoss (*Selaginella uliginosa*) and Bushy Clubmoss (*Lycopodium densum*), very fine specimens up to 28 in. high. (See *Vic. Nat.*, vol. LVIII, no. 2.) Santalaceæ—

Sour Currant Bush (*Leptomeria acidula*), not in flower; a rare plant, confined to eastern Victoria; was first collected by Robert Brown on the N.S.W. coast in 1802.

Apocynaceæ—Sea Box (*Alyxia buxifolia*), on the sand-dunes; was full of bright scarlet berries on which the birds were feeding.

Liliaceæ—Wombat Berry (*Eustrephus latifolia*); very plentiful; these beautiful golden berries, with pale green leaves, could be seen twining round both living and dead timber.

(I am indebted to Messrs. Morris and Willis, of the National Herbarium, for the naming and data of nearly all plants in the above list.)

Fungi were in great variety and vied with the flowers for colour and interest. The Agarics or Gilled Fungi were the most plentiful. It was impossible to go any distance without being arrested by hosts of these wonderful plants, the colours of which ranged through browns, yellows, whites and pinks to reds and mauves. Coral fungus was making bright patches of pinkish-yellow colour. Bracket Fungi were numerous. Great scarlet patches on dead wood, especially *Melaleuca* (abundant round the Inlet), were a lovely sight. Rainbow fungus was also festooning dead timber, but the most outstanding specimen was a lovely horseshoe-shaped fungus on a fallen tree which had been burnt. It was pale yellow in colour, like an English primrose, with a delicate pale green transparent under-surface.

Butterflies were numerous and varied. The Cabbage White, unfortunately, was everywhere in large numbers, and may already have established itself as a serious pest. The Wanderer was the largest and most handsome amongst a large and brightly-coloured group, mostly browns. There were smaller species of whites and yellows, and a tiny pale blue one.

Large Dragon-flies could always be seen in the vicinity of the water. A small damsel-fly, pale blue in colour, resting on a grass-stem and reflecting its image and surroundings in a clear pool, was a most pleasing picture.

Spiders were plentiful. Large orb-webbed and curl-leaf spiders were about in almost equal numbers. A wonderful colony of spiders lived round one of the tank-stands of the house; it was just a mass of web (very untidy), with innumerable small grey spiders occupying it. On one early morning walk over a flat covered in rushes I saw a lovely sight—the rushes were clothed in spiders' webs, and these in turn were covered in dew which sparkled like myriads of jewels as the rising sun outlined their fairy structure. The spider itself was quite small and greyish in colour.

Ants were enjoying this delayed touch of summer, and termites were numerous in certain areas. One large Eucalypt had been broken off over 30 feet from the ground, and the whole surface had been covered in their home-making by these busy creatures.

Snakes had been numerous during the summer, but I only saw one black snake near the river, although I was conscious of several rustles of the creatures whilst among heavy plant life near the coast. Water-dragons could be seen, but were more often heard flopping from logs on the banks of the Bemm into the river itself. Smaller lizards (one very dark species) and skinks were in evidence. I was too late to see the fruit-eating bats (which visit this area annually) but saw the result of their work in the orchard. Only one insectivorous bat was seen.

Kangaroos were to be seen in the country near the coast, and the Black-tailed Wallabies could always be seen quite close to the house, and their tracks were most marked near the swampy melaleuca areas. A Ring-tailed Possum lived in the roof of my room and could often be heard before dawn moving leaves and grass about, presumably fixing his or her nest.

The seashore did not reveal any good specimens of shells, but there were quantities of damaged sponges and on two occasions several dead fair-sized octopuses.

Aboriginal specimens were scarce. One fine axe-head had been dug up in the garden.

Birds held my attention most of the time, and although I was out most days before sunrise and rode home after sunset, the days were all too short for this fascinating pastime. In such diverse country and excellent conditions, it is not surprising that the bird list contains over 100 species. The first morning I listed the calls of birds commencing at dawn and continuing in order till sunrise. They were: Spur-winged Plovers, Black Swan, Kookaburra, Grey-backed Silver-eye, Whip-bird, White-backed Magpie, Magpie-Lark, and Australian Raven. As the sun rose there was a wonderful paean of song, it seemed, from all the birds in the neighbourhood.

During the first two days large numbers of Welcome Swallows (which built all round the verandahs) and a smaller number of Fairy Martins congregated on a wire structure near the house. Flying around were also a few Tree-Martins. On the evening of the second day most of the Welcome Swallows and all the Fairy Martins had gone, but the Tree-Martins remained.

During these two days hundreds of Spine-tailed Swifts visited the north side of the Inlet before noon, staying about an hour. Flying in from the north-east and north-west, their flight was at times only a few inches from the ground, and the noise of their wings cutting the air and the snaps of their mandibles as they caught their insect food were most remarkable.

Sea birds were not numerous, and the only Tern seen in any numbers was the Crested Tern.

Birds of prey, however, were present in numbers and species. Whistling Eagles were the most plentiful, and I saw many a wonderful display of aerial acrobatics by these birds in the early mornings. Such birds as Jardine's Harrier, or Spotted Harrier, Australian Goshawk, Collared Sparrowhawk, and Little Falcon could all be studied at fairly close quarters.

Colonies of Little Pied Cormorants could always be seen in the trees on the river banks, but other members of the group were scarce. Only one Black Cormorant was seen. Dusky Moorhens, Eastern Swamp-Hens, and a small party of Black-tailed Native Hens inhabited the river a few hundred yards from the house. The last-named bird is rather a rare visitor to southern Victoria.

Parrots were well represented, and the King Parrot (which had not been seen for some time) returned during my visit in numbers, as did the the Rainbow Lorikeet, which previously had been seen only in small parties. Musk, Purple-crowned, and Little Lorikeets were also plentiful and made a great screeching noise whilst feeding on the nectar of the blossoms of the tall Eucalypts.

Dead specimens of the Tawny Frogmouth, which, by the way, was a very dull dark grey bird, and the Barn Owl were picked up. The Frogmouth was comparatively rare, but the Barn Owl was numerous, as was also the Boobook Owl.

Amongst the smaller birds the gentle coo of the Peaceful Dove could always be heard in selected areas, and I was most interested in seeing the Yellow-throated Scrub-Wren in the same habitat as that of the White-browed Scrub-Wren.

Honeyeaters held pride of place, both for numbers and species. I have never heard such a din or seen such flitting of wings and general movement as occurred amongst the species inhabiting the sand-dune and Banksia country, as well as the edges of the Inlet, where many species congregated. These species were: Red Wattle-Bird, Little Wattle-Bird, Yellow-winged Honeyeater, Crescent Honeyeater, Eastern Spinebill, Yellow-faced Honeyeater, and White-eared Honeyeater.

In the tall Eucalypts of the Bemm River, with Satin Flycatchers and Eastern Shrike-Tits, were the Brown-headed Honeyeaters, Black-chinned Honeyeaters, and Whitenaped Honeyeaters Here also was a colony of Yellow-tufted Honeyeaters, which gave me many an hour of pleasure.

On one occasion on a trip to the coast I stopped at a point where the green and burnt scrub met and where half a dozen Saw Banksias were in bloom. Here the Red and Little Wattle-

Birds were feasting with the Yellow-winged and Crescent Honeyeaters. In a few seconds there appeared a pair of Whip-birds from the green area, which chased and called to each other round my horse's legs. Then I heard a faint cricket-like note, and suddenly, on top of the short green Melaleuca, were several Emu-Wrens. Soon there was a louder note and out came a party of Blue Wrens with some Brown Thornbills, then followed a scolding note and three White-browed Scrub Wrens followed the previous birds into the burnt area. All these birds kept flitting from the green to the burnt areas and singing all the time. My head would have required a swivel to follow all their movements.

On another excursion I saw a party of Emus, several Tawny-crowned Honeyeaters, and a party of Emu-Wrens all within a short distance of one another: in fact, they were all to be seen at the same time.

I feel I must end with a note on the devastating effect of our bush fires. Here, unfortunately, were large areas of forest with the black boles of giant trees pointing their ruined majesty to the sky and crashing at intervals in this warm weather to the blackened and scorched earth beneath. No sound of bird or beast or insect in all this waste space of ruin! To save our wonderful heritage of fauna and flora from like holocausts I would suggest that Nature Clubs in Victoria take some practical steps to help the suppression of bush fires and the making of sanctuaries on private properties. Country members of clubs could be of great help in this respect.

NOTE ON *DIURIS BREVISSIMA*

This *Diuris* species appears as a *nomen nudum* in R. D. FitzGerald's unpublished work in the Mitchell Library, Sydney. To comply with the recognized rules of nomenclature, appertaining to such underscribed forms, the description of this *Diuris* now appears in Latin under our joint names:

Diuris brevissima, FitzGerald-Nicholls.

Planta gracilis, circa 35 cm. alta. Folia plerumque duo linearia, canaliculata, circa 20 cm. longa. Flores 6-9 (in speciminibus meis), racema flexuosa, exiguis pedicellis, flavi manifeste maculati, maculis rubido-fuscis, sicut D. maculata, sed in D. brevissima, color est semper splendentior.

Sepalum dorsale 8 mm. to 1 cm. longum, lato-ovatum; sepala lateralia brevissima, lato-linearia, parallela 1·9 cm. longa. Petala pedicellata lamina plus-minus orbicularis. Labellum circa 1 cm. longum, flavious quam alia segmenta claris rubido-fuscis, maculis; lobi laterales oblique-oblongi; lamina duobus elevatis, parallelis, vel incurvatis, lamellis.

Diuris brevissima was fully described in the *Victorian Naturalist* (in English) Dec., 1939, pp. 125-127 (1 plate)).

W. H. NICHOLLS, Melbourne.

NOTES ON CERTAIN SPECIES OF *CALADENIA*

By W. H. NICHOLLS, Melbourne

The critical article on *Caladenia* in the April issue of the *Victorian Naturalist* calls for an answer, since some of the statements therein—I say this without disrespect to my friends Mr. Rupp and Mrs. Coleman—do not agree with my reading of the facts.

The writer of the notes, Rev. H. M. R. Rupp, writes in regard to *C. Patersonii*, R.Br., "a species which for over 100 years has been marked by the specific character, *sepals nonclavate.*" The late Dr. R. S. Rogers, however, records (in 1909), *C. Patersonii*, from Kangaroo Island (S. Aust.) with "strongly marked red-clavate points." (*Trans. Roy. Soc., S. Aust.*, xxxiii, p. 15.) Further, his remarks concerning this polymorphic species are of interest (*Ibid.*, xliv (1920), pp. 350-351), and corresponds to those of Mueller, who suggested the comprehensive title "*pulcherrima.*" A title designed (probably in sheer desperation), to cover the myriad forms to which this *Caladenia* is subject. Rogers writes, "Brown's description (of *C. Patersonii*) is unfortunately of too general a nature to exclude certain other filamentous *Caladenias*, which should be known under a different name. Natural hybridism is undoubtedly responsible for some of this confusion, perhaps for more than is suspected."

Undoubtedly the typical form of *C. Patersonii* does not possess *clavate* sepals, but Bentham (*Flora Australiensis*, vi, p. 381) says, "Sepals more or less dilated in the lower part, tapering into a long point sometimes *dilated* again towards the end." As *var. dilatata* (*C. dilatata* R.Br.) is described separately, it is safe to assume that this form is not also included in his general description.

And why, I ask, should we not include a (so-called) clubbed form within *C. Patersonii? C. dilatata* has both the clavate and the non-clavate sepals; so have *C. clavigera*, Cunn., *C. pumila*, Rogers, and *C. pallida*, Ldl. Also, Rogers records *C. reticulata*, FitzGerald, from Western Australia showing "no departure from type, except that the clavate points were missing . . . three specimens were found close together, two had clavate points to the sepals, one had not." (*Ibid.*, xliv (1920), p. 349).

Rogers, in his later descriptions, in Black's *Flora of South Australia* (1922), does not include therein all the known variations to which some species are subject. For example, in his description of *C. dilatata*, he writes "sepals clavate", yet most of us are aware that this feature is sometimes absent. And in his description of *C. pumila* (*Trans. Roy. Soc. S. Austr.*, xlvi (1922), he refers to the segments as being "non-caudata" (*no mention of club points*); yet "clubs" are sometimes in evidence. The present writer states the above examples to show that the published descriptions do not always embrace all known variations found in a particular species, *for there is no end to them.*

(Concerning these enlarged points: I consider distinction should be made between the true club-point as is found (for instance) in *C. clavigera*, and the acuminate lance-point of *C. Patersonii*, var. *hastata*.)

In regard to the last-mentioned varietal term, to which Mr. Rupp takes exception, I can only say, it is human to err! However, this error is not altogether a misnomer. It refers to the spear or lance-like points found in this particular variety, a feature here more strikingly marked than in other "Spiders." But, after all, it is merely a variety and not, in my opinion, a species (see Bentham's description of *C. Patersonii*), for the only really important variation is the presence of the prominent "clubs."

For the above reason I would not bracket this variety with *C. reticulata*, and *C. longiclavata*, Coleman, is as far removed, in a morphological sense, as are the respective habitats themselves. (For respective figures, see this journal, xlvi (1930), p. 196, et lviii (1941), p. 116.)

In reference to *C. clavigera*, Cunn. (*C. cordiformis*, Rogers), my own experience with this "Spider" proves that clubbed segments are present just as often as not. Yet on the Brisbane Hills (Vic.) three years ago every flower seen (27) possessed clubbed segments—in four specimens all the segments possessed these points.

The omission of the word "not" from the December article (to which Mr. Rupp refers) was unfortunate; still, that something was amiss could plainly be seen by the general context. As it stands this sentence is a contradictory one.

Finally, concerning FitzGerald's figure over *C. clavigera*, I consider it wise to await fuller investigation before finally deciding the status of this much-discussed form.

EXCURSION TO BOTANIC GARDENS

A visit to the Melbourne Botanic Gardens is always a delight. The one on May 30 was not scheduled to specialize in any particular botanical detail, but primarily to study how Australian trees enhance some of the fine landscape vistas in these famous gardens.

Ten representative Australian trees were selected for attention by the 80 odd visitors who attended the excursion. These comprised: Willow Myrtle (*Agonis flexuosa*); Princess Alexandra Palm (*Archontophoenix Alexandrae*); Apple Gum (*Angophora floribunda*); Gray Myrtle (*Backhousia myrtifolia*); Drooping Tree-myrtle (*Syzygium Ventenatii*); Grass-tree (*Xanthorrhoea resinosa*); Sydney Blue-gum (*Eucalyptus saligna*); Mahogany Gum (*Eucalyptus botryoides*); Cypress Pine (*Callitris arenosa*); Prickly-leaved Paper-bark (*Melaleuca styphelioides*). Seven of the species belong to the Myrtle family, chief among arboreal vegetation in the Australian continent. Broadly, the links connecting the genera selected and the differences separating them were pointed out. Their economic and ecological importance were also briefly mentioned. Special emphasis, however, was placed on their decorative value. Some of the Myrtaceae and other species examined are among the finest trees grown in the Gardens.

It was noted that improvements and additions had been made to that part of the Australian section traversed between Gates "D" and "E." These included plantings of species of Victorian terrestial orchids, which should appeal to naturalists when flowering time comes round.

H.C.E.S.

VICTORIA'S NEW TREE-FERN

Description of a new species of Tree-fern, which appeared in the *Victorian Naturalist* last month, has prompted a reader to ask several questions which can probably be answered by Mr. N. A. Wakefield, author of the species, who, however, is at present in the military forces:

"Because the new Tree-fern, a discovery of great interest, appears to be rare, and having in mind the great depredations made among Tree-ferns in the past, the following questions are asked: (a) Are the new ferns on Crown lands? (b) What special action should be taken to ensure their absolute protection? (c) Can those who cultivate Australian plants obtain sporangia to raise further plants and so guard against the possibility of its extinction?"

The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the Club was held on Monday, July 13, 1942. The President, Mr. P. Crosbie Morrison, presided and about 60 members and friends attended.

SUBJECT FOR THE EVENING

This was a symposium on "The Majestic Emu." Discussions were opened by the President, who reviewed the classification of the Emu and mentioned the various points upon which ornithological classification had been made. Other large birds of the group were briefly mentioned.

Mr. A. H. Chisholm followed with a discussion of the habits of the Emu. He pointed out that the idea of the loss of the power of flight was questioned, some authorities doubting if the bird had ever been able to fly. Other points brought out in the remarks were: Time of breeding, April to November; size of clutch of eggs, 8-10 normally but clutches of 17 and more had been reported, in which cases it was thought that other birds had used the nest; speed of the bird, 24-25 m.p.h. commonly, up to 28 m.p.h. at times, and in short bursts 40 m.p.h.; enemies of the Emu, the black-breasted buzzard had learnt to break the eggs by dropping stones on them from a considerable height; destruction of the Emu: in two years the Queensland Prickly Pear Board had paid 2/6 per head for 131,768 birds destroyed, and during the same time had paid 1/- each for 109,341 eggs destroyed.

Mr. F. S. Colliver spoke on fossil Emus. It was mentioned that Kangaroo, Flinders and King Islands, besides Tasmania, each had its own species of Emu, which were now extinct. Some at least of these species had been exterminated by the early sealers, and so quick was the destruction that very little material from the island was in any museum. The Flinders Island species (*D. peroni*) is known by two stuffed specimens and one skeleton in European museums. The King Island species (*D. minor*) is fairly well known from sub-fossil remains, the first extensive collections of which were made on an excursion of the Field Naturalists' Club.

A Queensland species (*D. patricius*, de Vis), of possible Pliocene Age, was described in 1888 from two odd bones (tibia and coracoid) and in 1905 a pelvic fragment was described as possibly belonging to the same species. Altogether some 12 species of fossil Emus have been listed, but these have been reduced now to the four known as follows: *Dromaius patricius*, De Vis, from Queensland; *D. minor*, Spencer, from King Island; *D. diemenensis*, Le Souef, from Tasmania, *D. peroni*, Rothschild, from Flinders Island.

The following were the main points in the discussions:

Mr. A. D. Hardy reported Emus swimming in the sea at Sperm Whale Head, a clutch of 16 eggs, and the birds attaining a speed of 40 m.p.h.

Mr. A. H. Mattingley mentioned that Emus often swam over the Murray River, and stated that many years ago he had written to the Paris Museum in an endeavour to have the type of the Flinders Island Emu returned to Australia.

Miss R. Chisholm asked why the Emu had such a large eye (reply by Mr. A. H. Chisholm, who suggested they were for long-distance sight), and where did the plumes come from that were used for soldiers' hats? (reply by Mrs. Freame, who stated they came from skins taken in Western Australia)

Miss R. Chisholm, for Mr A. S. Kenyon, asked was it a fact that Emus gathered in mobs at certain times to change mates. Mr. Mattingley stated that in his opinion this gathering did take place for the purpose mentioned.

Mr. R. G. Painter discussed Emus feeding on the flame heath, and on the duplication of the name "emu bush" in several States. Mr Ivo Hammett suggested that the name "emu bush" was coined on it being noticed that Emu droppings contained seeds of the bush concerned.

Mr. A. G. Hooke asked how it was possible for the young bird to break out of the egg. (Reply by Mr. Morrison, who stated that the egg was built on a common engineering principle, the arch, and was thus strongly resistant to external forces; but it was also like the arch, weak to an internal force, and further the young bird had a hard knob on its beak to use in breaking its way out of the shell.)

Miss Florence Smith asked did the eggs change colour? (Reply by Mr. Chisholm: A clutch of Emu's eggs varied in colour with the number of eggs in a large clutch, apparently owing to diminution of pigment available. He also stated that a bush fire passing over a nest of these eggs would entirely bleach the upper parts and leave an egg half normal colour and half white.)

Mr. Morrison mentioned an old bushman's story that the Emu laid one sterile egg, which is broken after the young hatch and used as a source of food for them, sometimes used directly and at other times allowed to become infested with fly larvae, which are used as food for the young. Mr. A. H. Chisholm suggested that this tale could be dismissed as being beyond the bounds of reason.

Mr. J. H. Willis mentioned the possibility of there being a southern centre of origin for the Australian flora and fauna, and further stated that the filmy ferns are definitely making a northward migration. Mr. H. C. E. Stewart stated that Prof. Wood Jones stressed this south to north migration.

Miss R. Chisholm asked regarding the ability of the Emu to swallow pebbles. In reply, Mr. A. H. Chisholm stated that the Emu used the mechanical action of grit to help in breaking up the food, and as the bird was of large size, quite large pebbles were used. Also, the Emu did have rather queer tastes in food; he knew of a bird that swallowed the contents of a tin of green paint and the tin itself shortly after. He also remembered seeing a tame Cassowary swallowing stones, almost as large as a fist, as often as they were given it.

CORRESPONDENCE

Letter from Mr. Hunter stating that most of the specimens of the recently described new species of Tree Fern were in a forest reserve, and that when opportunity offered he would try raising plants from spores.

REPORTS OF EXCURSIONS

Reports of excursions were given as follow: Ivanhoe, Native Plants under cultivation, Mr. Ivo Hammett; National Museum, Ethnology, Mr. F. S. Colliver, for Mr. A. S. Kenyon; National Museum, Fossils, Mr. F. S. Colliver.

GENERAL BUSINESS

Destruction of Kangaroos.—Mr. A. D. Hardy stated that applications were being made for an open season for kangaroos, owing, so it was alleged, to the damage they were causing to crops. He further stated that such applications always were made on these grounds when skins were high in price, and he moved that inquiries be made from the Fisheries and Game Department. This was seconded by Mr. W. H. Ingram and carried.

THE ROUGH TREE-FERN

In my experience the Rough Tree-fern (*Cyathea australis*) grows rather quickly and soon develops an upright trunk, but Mr. V. Miller has shown me fronds of this species from a plant in his fernery which has not risen above ground-level in the twelve years since he obtained it as a young specimen at Bass River; fronds are periodically sent up from the original short stem, yet no sign of a trunk has appeared.

J. H. Willis.

CORYBAS OR CORYSANTHES?

By Rev. H. M. R. Rupp, Northbridge, N.S.W.

This is an old question, and it is by no means the first time it has been raised in this journal. It was discussed by Mr. E. E. Pescott in the issue of May, 1926, and he there alludes to an earlier note of his own on the same subject.

The present writer, in collaboration with Mr. W. H. Nicholls, contributed a review of the known Australian species of the genus to the *Proceedings* of the Linnean Society of N.S.W. (Vol. liii, Part 2) in 1928. The authors retained Brown's name *Corysanthes*, and gave a reference to Mr. Pescott's article mentioned above. Subsequently, in the same *Proceedings*, Vol. liii, Part 5, 1928, I gave in detail our reasons for having adopted Brown's nomenclature, at the same time tabulating the Australian species as they would appear if Salisbury's generic name *Corybas* should be insisted upon.

Australian botanists in general appear to have upheld the point of view then expressed, and *Corysanthes* has prevailed throughout the Commonwealth. But it seems to me that the time has come for us to realize that the question cannot be settled by the preferences of Australians alone, for the genus extends from the Himalayan foothills in India throughout the archipelagoes between this continent and Asia, and as far as New Zealand, where there are at least ten species. Australia has only eight, while the total number for the whole area now exceeds fifty. And the weight of international botanical opinion is heavily in favour of Salisbury's name and against Brown's. The rule of priority, it is declared, cannot be set aside unless the consent of the recognized international authorities is expressly given in favour of the later name; and that consent in this particular case has been refused. We may regret the fact, but we must either accept it or become a law unto ourselves, in which case we cannot expect our decisions to receive international recognition.

I do not think that any good purpose can be served here by repeating the reasons which have influenced Bentham and other botanists in their rejection of Salisbury's name in spite of its priority of publication. Bentham's remarks in *Fl.Austr.* vi, p. 350, still appear to me to be very weighty, and I frankly admit that I dislike the idea of substituting Salisbury's nomenclature for Brown's. That, however, cannot justify me in declining to accept the decision of the international authorities, made after full discussion of all the facts of the case.

In a recent letter received from Mr. J. M. Black, the well-known South Australian botanist and compiler of *The Flora of South Australia*, he writes: "Dr. Sprague wrote to me . . . that the

International Council of Nomenclature had considered the conservation of *Corysanthes* and had decided against it." Mr. Black adds that if the U.S.A. botanists and the great majority of European ones favour *Corybos,* there is now little chance of *Corysanthes* being conserved.

We may feel sorry that, to use Bentham's term, there was something surreptitious about the publication of *Corybas,* and that Brown had good cause for his rather caustic remarks on the matter in his *Prodromus;* but after all, there can be no denying the fact that *Corybas* was published earlier than *Corysanthes.* And since the International Council has decided that the arguments in favour of *Corysanthes* are insufficiently strong to warrant the setting aside of the priority rule, I think we must loyally accept that decision, and in future adopt the generic name *Corybas.*

From a practical point of view, Salisbury's name is actually the better of the two. Not only does it express the same meaning (helmet) in a shorter word, but it avoides entirely the risk of confusion with the South American orchid genus *Coryanthes.* Such confusion has undoubtedly taken place in the past; e.g., in Darwin's classic *Fertilisation of Orchids,* p. 281, the New Zealand *Corysanthes triloba* appears as *Coryanthes triloba.* Only the difference of an "s" in the name; yet the two genera belong to widely-separated tribes of the Orchidaceae, and have little in common beyond the broad family characteristics.

Under Salisbury's nomenclature, then, the eight Australian species will appear as—

Corybas Salisb.
C. fimbriatus (R.Br.) Rchb.f.
C. diemenicus (Lindl.) Rupp and Nicholls.
C. pruinosus (Cunn.) Rupp and Nicholls.
C. dilatatus Rupp and Nicholls.
C. undulatus (Cunn.) Rupp and Nicholls.
C. aconitiflorus Salisb. (*Corysanthes bicalcarata* R.Br.).
C. unguiculatus (R.Br.) Rchb.f.
C. Fordhamii Rupp.

NOTE BY MR. W. H. NICHOLLS, MELBOURNE

I am in agreement with Mr. Rupp on his adoption of Salisbury's generic title *Corybas;* but only for reasons which coincide with his own. The overwhelming weight of overseas opinion has forced the issue; thus there can be little to say on the matter, other than useless words of regret. That *Corybas* Salisb. would eventually supersede *Corysanthes* R.Br. had long been anticipated in Australia; still, we hoped for the reverse. Now we bow to the inevitable!

NOTES ON THE GREAT BROWN STICK-INSECT

By EDITH COLEMAN, Blackburn, Victoria.

PART II.—DEVELOPMENT OF EGGS AND NYMPHS

The egg-capsules of the Stick-insect were sprayed from time to time to simulate, as far as possible, natural conditions; but when no change was noted in those that were dissected, they were thought to be infertile, and were sprinkled at longer intervals.

Unfortunately the last interval was too long. When I opened the box on November 29, 1941, the unexpected had happened—30 baby "Sticks" had emerged, to die through my neglect. Hatching had apparently commenced 10 or 12 days earlier. Next day 4 more emerged, and from that time, except after very cold nights, 2 to 5 emerged daily. Sixty emerged in December and 46 in January, 1942. At this stage I grew alarmed, having visions of 564 nymphs to care for. However, the last one appeared on February 1, 1942, giving me a family of 107 lettuce-green babies to feed and study. When a sketch of the eggs was made on February 4, four capsules were dissected. As these contained developing embryos, it is probable that another brood will appear in summer.

An interesting feature of the developing embryo, shown in the sketch, was the swollen appearance of the limbs, which suggested absorbing organs. As each tiny green baby pushed off the lid its amnion was shed, and left, like a little white shroud, within the brown capsule. A few were unable to free their long legs, and these died still attached by membranes to the inside of the egg.

After emergence each baby "Stick" rested for perhaps 20 minutes, then climbed to the perforated lid of the box. Emergence took place in early morning, a wise provision, affording a chance for the delicate creature to gain strength before exposure to winds and warm sunshine.

It was under an inch in length, measured from the tips of outstretched anterior legs to the end of its abdomen. Like many creatures that spend a lengthy period in the egg stage, the nymphs were active as soon as they emerged. When less than an hour old they curved their "tails" over their backs scorpion-wise, at a finger touch—a delightful show of "ferocity" in such tiny creatures.

When the box was shaken, or the lightest breath reached them, they rocked from side to side as expertly as their mother had done. When transferred to some gum twigs, they ran under leaves of their own green colour and were at once lost to the eye. One wondered how many in natural conditions would have survived the first weeks in January, when we experienced hot and cold winds and torrential rain—boisterous winds that broke off large boughs from our gum trees and littered the paths with leaves and twigs. Nature banks on numbers. "Of fifty seeds she brings but one to bear."

Growth of the nymphs was remarkably rapid. On December 19 some of them were 2 inches in length. On December 24 I saw one moult and eat the exuvia. After that I saw the process many times. Sometimes several would moult simultaneously. One or two died during the ordeal, being unable to withdraw their limbs.

On December 25, one nymph had changed from green to brown, while two were greenish-brown. On January 3, 1942, there were some with brown bodies, but the green pigment had not left the limbs. Three nymphs were now 2½ inches in length, and by the end of the month five had reached 4 inches. At this stage it was interesting to note how surely the green ones still sought shelter under green leaves, while brown ones adopted camouflage attitudes on twig or leaf-stalk. Many of the brown ones would cling to the roof of their cage like tiny sticks tossed into a heap, or a mass of brown thorns.

On March 16 there were still a few green nymphs, one of them being 3 inches long.

It was fascinating to watch the shedding of out-grown coats. The insect hung from a twig by its posterior feet, or perhaps hammock-wise with the end of its abdomen curved upward into a half circle. Head and legs emerged first. Reaching out a forefoot to grasp a support, it pulled itself forward, literally walking out of its skin. It remained motionless for about 30 minutes, gathering strength, and allowing the new skin to harden, then, grasping the cast skin with a forefoot, it turned head up and commenced to eat it, changing its position occasionally to facilitate holding its "meal" more comfortably. I removed one exuvia to examine, and later suspended it a few inches from its owner. She soon discovered and devoured it.

When disturbed, the nymphs move easily and rapidly, climbing from twig to twig before a following finger, or dropping to the ground to seek cover. Even when walking over the floor they cover the distance swiftly, albeit with the wavering gait of an inebriate. The long, thin legs have a stiff, Dutch-doll action.

Just how swiftly they are able to move I came to realize when transferring nearly 100 lively "Sticks" to a fresh cage. One would cast itself to the floor and become so rigid as to appear lifeless, its legs standing out "every which way at once," like the spines of Kipling's Stickly-prickly. I was tricked by this attitude as one lay on the floor. It remained stiff, like a real twig, when I lifted it out of the cage; then, as I gently attempted to straighten it out for measuring, it "came to life" and made off rapidly

It is surprising how long they can hold this pose. One might lift the insect by a leg only, while it maintained the same rigidity of body and contorted legs.

I think there is little doubt that Stick-insects are able to control the body pigment to match the supports to which they cling. Their preference for the roof of a cage, whether wire or wood, suggests that in normal conditions they climb as high as possible.

The male Stick-insect has longer legs and antennae than the female, and his body is very much slenderer.

At the beginning of April, 1942, many males and females had revealed wing-buds. On April 21, at 8 a.m., one of the males was suspended in moulting attitude. Two hours later it had emerged—the first adult of the brood. His long wings, perfectly fitted for flight, are quite unlike the short broad wings of the female, which permit only planing leaps. They reach almost to his second last abdominal segment.

His antennae are 2½ inches in length, almost as long as his anterior legs. They sweep out independently in any direction, suggesting that they serve an important function. They probably catch emanations of scent, or sound vibrations, and serve as organs of touch.

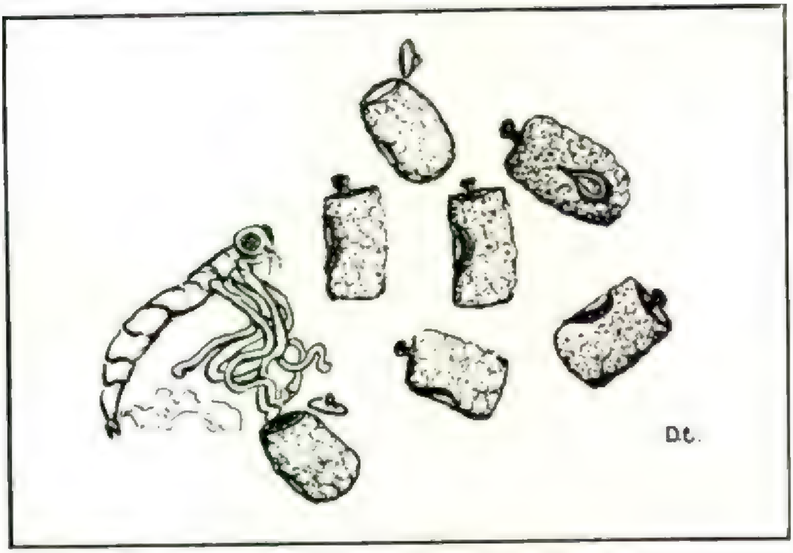
This emergence of a male late in April, while as yet no adult females had emerged, seems proof assumptive that there would have been no adult male Stick-insects on the wing at the time when his mother was at liberty.

It is possible that adult males had over-wintered, but I do not think so, for they seem more delicate than the females, and do not appear to eat sufficient to store enough energy to tide them over a severe winter. They are more timid than the females, which seem to have little concern for anything but food.

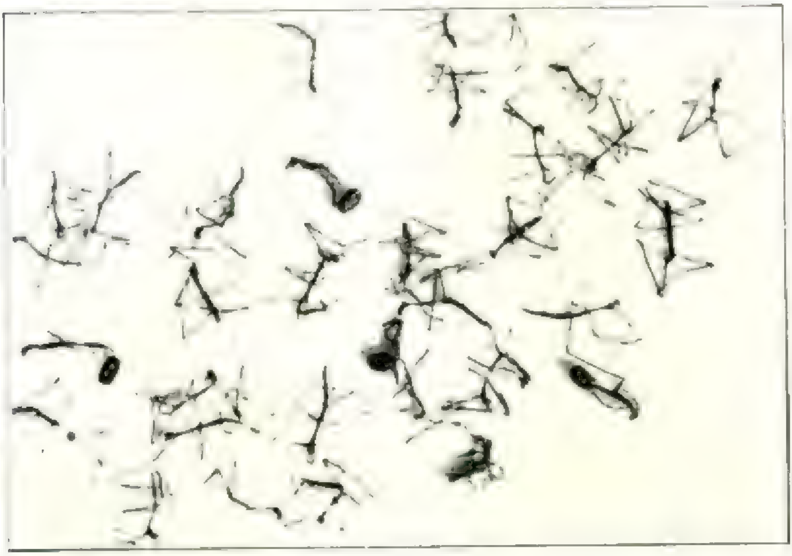
To-day (April 28) at 8.30 a.m., I found that a female had completed her final ecdysis. The exuvia was suspended by one foot 5 inches distant from her. She was very sensitive and rocked violently at the slightest touch on the cage, at a footfall, or even the lightest breath. She occasionally waved her legs and exercised her wings, then remained quiescent. So far (4 p.m.) she has not attempted to eat the exuvia. She seems huge, and measures at least 10½ inches. (The male is 8½ inches long.) Her antennae are only 1 inch in length.

The sexes appear to be evenly distributed. At the present time there are in one cage eight male nymphs awaiting final moult and one fully adult male. In another cage are nymphs of

Plate VII



Egg-capsules of Great Brown Stick-insect (enlarged)



Newly-emerged Stick-insect nymphs.

Photo.: Edith Coleman.

both sexes, of all ages. In a third cage are five females, four of which should soon moult for the last time. The fifth one moulted to-day (April 28), the first adult female of the brood. These will remain alone to answer the question, "Does parthenogenesis occur in such large insects as the Great Brown Phasma?"

Later.—On May 14 another egg hatched. The tardy newcomer is growing apace, the only green insect in the brood.

June 8: Another male passed through the final moult. There are now two adult males.

June 19: The only adult female dropped 3 eggs. To date (July 16) she has dropped 33. She is 10½ inches long

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NOTES ON AUSTRALIAN EELS

By F. LEWIS, Chief Inspector of Fisheries and Game, Victoria.

(Portion of address to April meeting of F.N.C.)

The life-history of the common freshwater eel has been shrouded in mystery throughout the ages, and it was not until early in the 20th century that this mystery was solved, mainly by the researches carried out by a Danish scientist, Dr. Johann Schmidt.

One writer has said that of all the well-known fish none can compete with the common eel for the amount of superstition and prejudice which it has engendered. Aristotle said eels sprang from mud. Pliny considered that small pieces of skin rubbed from their bodies on stones turned into the young. Helmont, a disciple of Paracelsus, gave the following recipe for raising eels: "Cut up two tufts covered with May dew and lay one upon the other, the grassy side inwards, then expose them to the heat of the sun. In a few hours there will spring up numbers of eels." Similar beliefs were common in the Highlands of Scotland years ago, and even in England to this day it is a common belief in country districts that horse-hairs placed in a stream will turn into little eels. The air-bladders of fish, including eels, sometimes have small worms therein—examples of the gordius worm. These have been sent to me as proof that eels do not breed in the sea.

Kaup, in 1856, described a little fish which had been taken in the straits of Messina; it was perfectly transparent like glass, leaf-shaped, and had a narrow head. He called this Leptocephalus, which means "narrow headed." This specimen was about three inches in length. The Italian scientist Grassi in 1896 demonstrated that this fish was not a new species, but the larval form of the common eel.

That, however, was only the beginning of the problem. It was known that in the autumn the adult eels leave the rivers of Europe and disappear for ever. Occasional specimens are picked up by the trawlers, but the great majority are never seen again. In the spring millions of elvers come up into the rivers. Where do the mature eels go and where do the elvers come from? That was the problem that Dr. Schmidt set out to solve. By tow-netting and dredging across the Atlantic he secured eel larvae ranging from three inches to half an inch in length, until at last he discovered that an area near the West Indies was the place where the eels bred. Close by and overlapping it to a certain extent was the breeding-place of the American eel.

Further experiments proved that it took the European eel larvae three years to make the journey to Europe, which they reach in the autumn of the third year after hatching. At this stage they are about three inches in length and leaf-shaped, and are perfectly transparent, like the Leptocephalus described by Kaup in 1856. These larvae remain in coastal waters until the following spring, gradually changing into the typical eel shape, and in late spring they make up into the rivers in millions.

There are two species of eels found on the eastern Australian coast. In the spring and early summer months, millions of little elvers enter the streams, but it is only when they are blocked by falls or similar obstructions that their ascent can be seen. There are several places in Victoria where, given favourable opportunities, the ascent of the elvers can be seen. Chief amongst them are the Hopkins Falls, near Warrnambool.

The large eel so common in Gippsland streams, and known locally as the "conger eel," is a tropical and sub-tropical species which ranges from Cape York to Westernport Bay. It grows to very large sizes, the biggest which I have on record being one taken in the Macallister River on November 5, 1932. It weighed 32 lbs., was 5 ft. 4 in. in length, and had a girth of 20½ in. This eel is known as *Anguilla reinhardti*, in the vernacular the long-finned or spotted eel.

A further species found on our coast is a much smaller eel which ranges from the Richmond River in northern N.S.W. then southerly and westerly to the Glenelg River in Victoria. This is *A. australis*, the short-finned or unspotted eel. It does not grow to such large sizes as the long-finned eel, but specimens from Lake Burrumbeet, near Ballarat, are known to have reached a weight of about seven pounds. Usually, however, this species does not exceed two or three pounds in weight.

NOTES ON VICTORIAN RHAMNACEÆ—PART 2

By JAMES H. WILLIS, National Herbarium, Melbourne.

(a) CONCERNING *POMADERRIS VELUTINA*

Since describing this species in the *Victorian Naturalist* for March, I have acquired further useful data on its extent and distribution from Mr. W. Hunter, our chief exponent of the East Gippsland flora, and have his permission to record them.

Mr. Hunter has not found the new species at a higher elevation than 2,500 feet and so challenges my statement of its occurrence at the "headwaters" of north-eastern streams. Admittedly, I would have been nearer the truth to have said "upper reaches," but Mr. Hunter first located the plant by the *lower* reaches of Buchan River, near its junction with the Snowy, in September, 1936, and recognized it as distinct from any Victorian Pomaderris known to him; there, in a good rainfall area, it extends along low spurs or stony bluffs close to watercourses, but is not *riparian* (as stated in my article). On slopes toward the Timbarra River (Buchan-Ensay road) many small patches and isolated plants of this attractive silvery shrub may be seen: here would have been a much better type locality than the Ovens near Bright, where *Pomaderris velutina* is apparently quite rare. At Suggan Buggan and Ingeegoodbee (the easterly limit of occurrence) it is also rare and grows in "fairly open forest country on sandy and/or stony soils of granitic, sandstone, or porphyritic formation."

It is most regrettable that I was unaware of Mr. Hunter's detailed observations in the field when preparing my paper on the new species; his Buchan and Ingeegoodbee records were inserted on the proof sheets only at the last moment and then from information kindly supplied by Mr. T. S. Hart. In Mr. Hunter's experience, late September to early October is the flowering season; he considers *P. velutina* to be much more closely related to *P. phillyreoides* of N.S.W. than to *P. lanigera*, despite the narrower, dorsally glabrous leaves of the former, and I believe he is right—the flowers of both species are hardly distinguishable. Since *velutina* has been variously referred to *Spyridium parvifolium*, *Pomaderris vacciniifolia* and *P. cinerea* (on the superficial likeness of foliage, no doubt), it is a wonder some botanist did not appreciate the affinities with *P. phillyreoides*. My remark that *velutina* has "none of the coarser, rust-coloured hairs so conspicuous in *P. lanigera*" was not intended to imply that it entirely lacked ferruginous hairs; they are indeed present on the veins and petioles, but finer and less noticeable than in *P. lanigera*.

Stewart's Creek just north of Bruthen is the probable locality meant by Howitt on his label "Stuart's Creek, Tambo." Near here occur the congeners *apetala* and *betulina*, while at Monkey Creek (Bruthen) and Wibenduck Creek near Orbost our rarest Pomaderris is located—only one or two individual plants of *P. ligustrina* have been observed at each place (the first record by W. Hunter, September, 1937).

(b) DISTRIBUTION OF *DISCARIA AUSTRALIS* Hook.f.

The Southern Anchor Plant is seldom collected and must be regarded as one of our uncommon shrubs. First mention of its occurrence in Victoria comes from the Journal of Major Thomas Mitchell (September 27, 1836), in the following words:

> Here we saw for the first time the *Discaria australis*, a remarkable green, leafless, spiny bush, resembling in a most striking manner the Colletias of Chile.

Mitchell's expedition was at that time traversing basaltic grassland in the vicinity of the Loddon River, near present-day Newstead. Shortly after the initial gold rush, Baron von Mueller came to this rich upland plain, and he secured specimens of Discaria from "between the Loddon and Creswick Creek" (Jan., 1853).

While living in the Creswick district from 1928 to 1932, the possibility of re-establishing a Mitchellian and a Mueller record lured me to explore the uncultivated volcanic tracts stretching away north, and at last I succeeded in finding several plants in the narrow rocky valley of Birch's Creek (below Clunes reservoir, a few miles west of Newlyn), so Discaria has here survived a century of agriculture and probably still flourishes among remnants of the original flora along Joyce's Creek and other streams toward Moolort. Lang found it many years ago at Mount Warrenheip, and H. B. Williamson some thirty years since at Lal Lal falls on the Moorabool River. I have also seen an occasional Anchor Plant on the plains adjoining Middle Creek, near Mount Cole: hence, from records at present aavilable it would seem that the species is confined in its distribution west of Melbourne to the basalt region within thirty miles of Ballarat.

As for the east, occurrences are more widespread: Mueller gives Delatite River, and Mrs. McCann the upper Ovens, while Meebold collected Discaria on the upper Mitta Mitta. Williamson found giant examples, up to ten feet high and three inches in diameter, near Cobungra (at about 4,000 feet), and many of these had unusually short spines. Mr. Hunter reports the following stations:

1. Close to Livingstone Creek, Omeo—2,000 feet.
2. Black Mountain Plateau, Wulgulmerang—3,000 feet.
3. Ingeegoodbee, near the river.
4. Monaro plateau between Delegete and Bombala.

He has found *Discaria australis* invariably in open grassy country, the individual plants being scattered and up to two feet in height; very occasionally a plant will consist of one single upright stem.

Judging from the quantity of material in the National Herbarium, Anchor Plants would seem to have been abundant in the New England district of New South Wales, and to be more frequent in Tasmania than through our State.

KILLING OF KANGAROOS

Subsequent to the last meeting of the F.N.C., a statement appeared in the Melbourne *Herald* setting out that the Club opposed the proposed open season for kangaroos in the Bairnsdale Shire. The agitation, it was suggested, was largely political and probably was prompted by a desire to obtain the animals' skins. Landholders, it was added, were already sufficiently protected by being permitted to have licences to kill kangaroos on their property if need arose.

To this statement Cr. Cameron, of Bairnsdale, replied with a denial that the agitation was political. He did not discuss the question of licences, but claimed that the kangaroos were very numerous and destructive.

The F.N.C., in further comment on the matter, accepted Cr. Cameron's denial of political motive (as far as he was concerned), but pointed out that he had again avoided explaining why, if kangaroos really were troublesome, landholders did not apply for individual licences to kill on their own property. It was suggested, therefore, that the Bairnsdale agitators "must not feel aggrieved if the public in general—and naturalists in particular—view their complaints with suspicion."

NATURAL HISTORY MEDALLION

By agreement between the various clubs relating to the presentation of the Australian Natural History Medallion, the Bird Observers' Club and the Leach Memorial Club jointly are arranging this year's function. The presentation is to be made in the Victoria Banqueting Hall, on Tuesday, August 11, at 8 p.m. The cost of the refreshments is to be 3/- each person. The joint Secretaries are Mrs. F. E. Howe (61 Doncaster East Road, Mitcham) and Miss N. F. Fletcher (Chalmers Hall, Parliament Place, Melbourne) and it is necessary to reserve seats not later than August 8.

EXHIBITS AT F.N.C., JULY 13

Mr. C. French—*Eriostemon obovalis* (Fairy Wax Flower) with double flowers; Tea-trees (*Leptospermum scoparium* var. *Sandersii*, *L. scoparium* var. *Walkeri*, *L. scoparium* var. *Keatleyi*), all garden-grown.

Mr. H. P. Dickins—Orchids (*Acianthus exsertus*, *A. reniformis*).

Mr. J. H. Willis—Tiny Duckweed (living specimens of the smallest flowering plant in the world, collected from a pond in the Flagstaff Gardens); also Flax Lily (*Dianella coerula*), which has developed cane-like stems as high as a man.

Mr. R. G. Painter—Garden-grown native plants, including *Acmena Smithii*, *Correa reflexa*, *C. reflexa* var. *rubra*, *Epacris impressa*, *Grevillea Dallachiana*, *G. lanigera*, *G. oleoides* var. *dimorpha*, *G. rosmarinifolia*, *G. Thelemanniana*, *Hakea sericea* var. *lissosperma*, *Hardenbergia monophylla* var. *rosea*, and *Viola hederacea*.

BIRD NOTES FROM CROAJINGOLONG

By N. A. WAKEFIELD, Genoa, Victoria.

Since an article on this topic was published in the *Victorian Naturalist* of July, 1941, further investigation has brought to light some interesting records, and observation has added much to the information available on the birds of the far eastern corner of our State. As before, the common birds will not be mentioned unless there is something of particular interest to remark in connection with them.

During trips to Mallacoota, the blue form of the Reef Heron was seen twice, on the Bastion Rocks and at the mouth of the Betka River; a few Little Terns (*Sterna albifrons*) were generally flying about the entrance of the Inlet; and on the Goodwin Sands in the main lake there were a number of Sharp-tailed Sandpipers. In the coastal heaths, about dusk, the mournful whistle of the Little Grassbird was often heard, and over the upper reaches of the Inlet a single White-breasted Sea-Eagle was sometimes seen.

The Pink Robin was observed twice in the vicinity of the water; once, in a densely scrubby gully, a fleeting glimpse was caught of the Pilot-Bird as it fled from a clump of ferns; in the same spot the Brown Warbler is often seen feeding in the foliage of the lilly-pilly trees; and the Olive-backed Oriole has been noted at times in the eucalypts on the hillsides.

At an isolated farm at the head of the Wingan River, a number of Hooded Robins nested last spring; and at Genoa, on a timbered slope, several Brush Cuckoos were seen once in company with their two larger relatives, the Pallid and Fan-tailed Cuckoos.

Like several other lovers of the open country, the Dollar-bird sometimes crosses the border from Monaro, and pays a visit to the Genoa and Cann Rivers; and the White Ibis does likewise in very dry weather.

It is interesting to note that two of Victoria's commonest birds, the White-plumed Honeyeater and the Noisy Miner, though plentiful about Bairnsdale, have each been recorded once only in the district under discussion, and then only about the mouth of the Snowy River; and probably they never penetrate farther into the area. The Golden Bronze Cuckoo can be placed on record for Orbost, for in the spring of 1935 its bronze-coloured egg was found in the nest of a Yellow-tailed Thornbill, in a black wattle tree, near the Snowy River.

Some interesting records have been supplied by Mr. B. H. Buckland, a native of Mallacoota and at present a resident of Genoa. Many years ago, a single Cape Barren Goose was shot on the upper lake at Mallacoota; the Plumed Egret used to frequent the same locality; and on one occasion the Topknot

Pigeon was seen in the vicinity of Dowell's River. (In 1917 Miss E. Dorran, of Mallacoota, sent local specimens of the Topknot Pigeon, the Rose-crowned Fruit Pigeon and the Koel to the Melbourne Museum.)

Among the sea-birds reported from outside Mallacoota is the Greater Frigate-bird, a rare visitor from more northern waters; and in dry seasons the Blue-winged Shoveler and Pink-eared Duck come down from the northern plains to the Genoa district. The Beautiful Firetail, Black-shouldered Kite and Peregrine Falcon are rare visitors to the same locality; the pretty Regent Honeyeater is to be found at Mallacoota in the coastal scrubs; and the numerous wading-birds include the Greenshank, reported from the head of the Inlet, near Genoa, and the Whimbrel from the mud-flats near the mouth of the Wingan River.

Mr. Alf. Ah Chow, a farmer of Orbost, reports the Eastern Golden Plover as often visiting the flats of the Snowy River, and he has seen the Fork-tailed Swift about there, too; but more remarkable is the report that a Bustard was shot many years ago in timbered country at Mossiface, in the lower Tambo Valley. The Bustard once used to visit southern Monaro Plains and probably sometimes used to cross the border into the Bendoc district, but why a single bird should have been found so far from its natural habitat is beyond explanation. A similar report from the same source is of a pair of Black-backed Magpies nesting on the Orbost flats. Recently the Red-capped Robin was photographed at Mallacoota—and that is a typical inland bird. Similar cases of isolated wanderers crop up from time to time. A few years ago, Mr. H. R. Wakefield identified a Black Currawong (*Strepera fuliginosa*) right in the Orbost township; and he tells, too, of "a small dove with a red wing round its eye"—the Diamond Dove—seen recently in the same locality.

In 1941, Mr. H. Mead, of Genoa, observed a single Royal Spoonbill in swampy country near the head of the Wingan River! and Mr. Tom Jones, of Wonboyn, N.S.W., tells of a pair of Pied Geese which stayed a few months at Wangrabelle during the 1919 drought.

Three uncommon birds not already mentioned, the Swift Parrot and the Leaden and Black-faced Flycatchers, were reported by the R.A.O.U. party which visited Marlo in 1935, and in 1914 a similar expedition to Mallacoota recorded thirteen species which have not been reported since for any part of the district. These include the Arctic Skua, Curlew-Sandpiper, Collard Sparrow-hawk, Powerful Owl, Purple-crowned Lorikeet, Little Cuckoo-Shrike, Jardine Caterpillar-Eater, and a number of sea-birds.

A few corrections are necessary to bring the article of July, 1941, up to date. The record of the Osprey was based on incomplete observation and has not been confirmed, and there is no other evidence of the bird ever having been seen in the district. The case of the record of the Little Quail is the same: the specimens observed were probably females of the King Quail. It is very likely that the report of the Plumed Tree-Duck really referred to the Whistling Tree-Duck, and it is almost certain that the Australian Crow mentioned was only a young phase of the common Australian Raven.

BOTANICAL "BULLS"

In the exploration and mapping of little known, if vast, tracts of country, it is only too possible for a visiting scientist to be swept away by the constant thrill of new discoveries and to forget the mass of accurate data accumulated by others before him; but when a professor of botany in a great university rushes recklessly into print, the fruit of his indiscretion is the more spectacular.

The first *Flora of the Northern Territory*, embracing 387 octavo pages, appeared in 1917 under the joint authorship of Professor Alfred J. Ewart, D.Sc., Ph.D., F.L.S., and Olive B. Davies, M.Sc. In it four genera are delineated and described as new to science, viz.—*SPATHIA* and *SETOSA* (*Gramineæ*), *CARPENTIA* (*Convolvulaceæ*) and *ROSSITTIA* (*Rutaceæ*). Of these, S. T Blake (Australia's leading informant on the Glumiflorae) says that *Spathia* is apparently valid, though he draws attention to its strong affinities with *Dichanthium*, whereas Pilger (in *Notizblatt*, Berlin, 1928) has shown *Setosa* to be identical with Robert Brown's old species *Chamaeraphis hordeacea*—a name which Ewart himself also retains in another part of his "Flora."

P. F. Morris and P. R. H. St. John critically examined (1937) the type of *Carpentia* and failed to distinguish it from the world-wide and well-known *Cressa cretica*, L., of the same family. I have followed up their examination, comparing Ewart's type figure of *Carpentia floribunda* with H. G. Reichenbach's illustration of *Cressa cretica* in *Icones Floræ Germanicæ, etc.*, Vol. XVIII (t. 1335) and the two cannot be separated. Ewart's statement, "distinguished from *Breweria* and *Cressa* by the inflorescence which is solitary and terminal and by the variable number of styles with discoid stigmas," is discredited by the fact that many plants of *Cressa cretica* show solitary, terminal flowers and have discoid stigmas, whilst he admits that there are "usually two" of the latter in *Carpentia*.

Concerning *Rossittia*, a new and remarkable genus of Rutaceæ, the fall from grace is still more profound. Wherein does the figure and description of *Rossittia scabra* differ a hair's-breadth from those of Robert Brown's *Hibbertia lepidota* (Dilleniaceæ)? Ewart's type might have been gathered from the same bush as Brown's type (both in the National Herbarium, Melbourne) and I have no hesitation in pronouncing them identical. The presence of up to 20 stamens, located principally on one side of the two bi-ovulate carpels, the large deeply separated, and unequal calyx lobes, likewise the absence of pellucid odorous oil dots in the foliage, are criteria which combine to brand the ostensible new genus as thoroughly un-Rutaceous, and I am at a loss to know just why Ewart associated it with *Eriostemon* and *Phebalium*.

Thus, three out of four "new" genera must lapse into synonymy, and one is naturally constrained to look upon the remaining 26 new species with certain misgivings until their validity or otherwise be attested.

JAMES H. WILLIS, National Herbarium of Victoria.

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PROCEEDINGS

The ordinary monthly meeting of the Club was held on Monday, August 10, 1942. The President (Mr. P. Crosbie Morrison) presided and about 60 members and friends attended.

SUBJECT FOR THE EVENING

An illustrated lecture on "Eyes of the Bush" was given by Dr. Kevin O'Day. A series of lantern slides illustrating the anatomy of the human eye was first shown, and then a large series showing the structures of various Australian nocturnal and diurnal animals. Comparisons between these animals were made and differences due to environment pointed out. One interesting comparison made was between the platypus and marine turtle, two animals entirely different yet having eyes closely allied, no doubt due to similar habits. Another interesting point made was that whilst lizards' eyes might be termed typically reptilian, the eyes of snakes were so different that they could not be classed within the same group.

At the end of the lecture a series of slides showing the animals whose eyes had been dealt with were shown and discussed.

The President conveyed the thanks of the Club to the lecturer.

BUSINESS FROM THE MINUTES

(a) Proposed Open Season for Kangaroos.—A letter from the Chief Inspector of Fisheries and Game giving information re the methods of policing permits to shoot a limited number of animals. (Reported by Mr. G. N. Hyam, in Committee, that an open season was not sought.)

(b) Wildflower Picking and Radio Announcing.—A letter from the manager of 3AW, stating it had been noted that most of the wildflowers were protected, and that any wrong impressions given by the announcer would be corrected.

REPORTS OF EXCURSIONS

Mr. F. S. Colliver reported on the recent excursion to the National Museum under the joint leadership of Messrs. S. R. Mitchell and A. C. Frostick.

ELECTION OF MEMBERS

The following were duly elected as ordinary members of the Club: Miss N. J. Fletcher and Messrs. G. A. Thomas and A. P. Jenkin.

GENERAL BUSINESS

(a) Forthcoming Excursions.—These were spoken to by their respective leaders. Mr. H. C. E. Stewart said that another of the quarterly visits to the Botanic Gardens would take place before the next meeting, and Mr. F. S. Colliver stated that the proposed planting at Maling's Quarry would take place as soon as the ground was prepared.

(b) Questions by Members.—*Question*: Why do wading birds wade? Are they denizens of swamp or seashore because of their long legs, or have their legs evolved by their habitat? Can jabirus and brolgas be regarded as true waders? *Answer* (by Mr. E. S. Hanks): It is suggested that the legs of waders gradually evolved; jabirus and brolgas are not classed as waders.

EXHIBITS

Mrs. M. E. Freame—Curios from Tonga.

Mr. Chas. French—Flowers of *Leptospermum scoparium*, var. *rosea* (double-flowered form) with three varieties, violet, pink and white. *Hardenbergia monophylla*, *Grevillea asplenifolia* and *Clematis microphylla*; all garden-grown.

Mr. J. H. Willis—Water-colour drawings of eight attractive Victorian berries by the late Mr. Malcolm Howie; also *Astelia nervosa* var. *australiana*, Victoria's largest and probably most localized native lily.

Mr. R. G. Painter—Garden-grown native flowers, including *Grevillea rosmarinifolia*, *G. oleoides*, var. *dimorpha*, *G. Thelemanniana*, *G. lavandulacea* (red-flowered form), *G. lanigera*, *Hardenbergia monophylla*, *H. monophylla* var. *ovata*, *H. monophylla* var. *rosea*, *Bachysema lanceolatus*, *Correa reflexa*, *Hakea sericea* var. *lissosperma*.

Mr. Ivo. Hammett—Large collection of garden-grown native flowers.

ON THE OWEN STANLEY RANGE

The Owen Stanley Range, Papua, is at present Australia's chief bastion in the war against the Japanese. That fact revives interest in a paper on the subject published in the *Victorian Naturalist* in January of 1907. Written by C. C. Simpson, it describes a journey from Port Moresby to Kokeda, and it gives a great deal of information regarding the nature of the country, and in particular its birds-of-paradise.

BIRDS OF A MELBOURNE PARK

By A. H. CHISHOLM

Melbourne bird-watchers are, or were, fortunate in having Wattle Park, an eastern suburban area of considerable extent, and one well supplied with gum-trees and wattles, accessible by tram from the city. I say "were" because the most bird-haunted portion of the reservation has recently become cluttered up with military tents, by reason of which it seems probable that nests in the area during the spring now at hand will be relatively few.

The portion of the Park to be discussed here is a strip of territory at the eastern extremity. It is only about 600 yards long by 300 yards wide, and its trees consist of "natural" eucalypts (mainly box) and planted wattles. Except for a few shrubs at a point where the Park adjoins a vegetable-garden, there is no undergrowth that would readily accommodate blue wrens, scrub-wrens, etc., but grass grows abundantly enough to provide cover for at least one ground-nesting species. The only assured diversion is an eroded channel that sometimes carries a little water and thus occasionally adds to the bird-list by accommodating a passing wader.

Having in mind the smallness and uniformity of this particular section of the reservation, and recalling that many common birds that might well be there are *not* there, it is remarkable how many species were recorded for the spot last spring and summer, and how many nests were found. The total number of species recorded during twelve casual visits extending over six months (August-January) was 38; and the number of species found breeding in the limited area in that period was 19. Neither of these figures includes introduced birds, of which six species are found in or near the reservation.

Taking the immigrants into account, it is always possible to record 20 to 30 species in the restricted area under notice (the East end) within an hour or two on any bright day in high spring: that is, in a good season such as that of last year. Mr. A. S. Chalk (who was my companion on most of the excursions) will recall that he and I usually recorded more than 20 species on each visit in October-November, and found most of them to be nesting. This, it will be agreed, is a healthy achievement for a mere section of a Melbourne park, particularly one that lacks shrubberies and which carries a considerable volume of human traffic.

Several of the species which bred last year are birds whose nests are not often found within the gates of a city. They include the Regent Honeyeater, Scarlet Robin, Rufous Song-lark, Oriole, Shrike-tit, and Bronzewing Pigeon. On the other hand, several common species which might have been expected to visit the area have not been seen, and certain others which "looked in" failed to nest there. For example, I have searched vainly in the Park (on the limited acquaintance of two seasons) for the Tawny Frogmouth, for Pardalotes, for Sittellas, and for other common birds which should be suited by the trees of the area. But the absence of certain birds which nest in hollows (e.g., Treecreepers), together with the fact that certain others of the same habit (e.g., Kookaburras) do not breed in the reservation, is not surprising, the point being that the few hollows available are monopolized by starlings or sparrows. Nesting-boxes were erected in the Park a few years ago, but these have been allowed to fall to decay.

Here, then, are notes made on 38 species recorded in the Eastern section of the Park in 12 visits paid during last spring and summer, together with one or two notes obtained on a few visits in the previous year:

Parrots.—No Parrots are known to breed in the Park, but four species have been recorded as casual visitors Crimson Rosellas (Lowries) and Red (Eastern) Rosellas have been seen once or twice; on November 26 I was surprised to see four Budgerigahs chattering their way through the trees, and in January of this year a number of the pretty Swift Parrots were in the reservation for some days. Doubtless one or two species of Lorikeets also are occasional visitors to the gum-trees.

Flycatchers.—Several pairs of Wagtails are constant to the area. In September they begin to weave their dainty nests, on horizontal branches of either wattles or gums, at heights varying from about 10 to 40 ft. Seven or eight nests were found last spring. One pair appeared to have four broods. Our second most familiar flycatcher, the Grey Fantail, is always present during winter, but has not been known to breed in the Park. Curiously, I have no record of either the Brown Flycatcher (Jacky Winter) or the Restless Flycatcher (Scissors-grinder). Possibly there is rather much grass for Jacky Winter's purpose, and it may be that the human traffic is too constant to allow the low-flying Restless Flycatcher to work in comfort. In any event the Brown Flycatcher is not nearly as common in Melbourne as in Sydney.

Robins.—Two species are recorded. The Flame-breast frequents neighbouring gardens and the fringes of the Park during winter, but disappears in spring, whereas the Scarlet-breast, which strikes a brilliant colour-note against the gold of the wattles, stays to breed. As early as August 3 last year we were surprised to find a female Scarlet-breast sitting on three eggs in a nest situated about 20 ft. aloft in a gum-tree. This pair nested again (in a wattle-tree) during September, but the nest was wrecked when the authorities, with their usual blindness to the rights of birds, decided to eliminate a number of trees. Lack of shrubs or undergrowth is probably the reason why the Yellow Robin is not found in the Park.

Thornbills.—Two species, the Yellow-tailed and Little Thornbills (Tits), appear to be "permanents." The area is in fact one of the few places near Melbourne where it is always possible to find the dainty Little Thornbill. One of the customary "double-decker" nests of the Yellow-tail was found (built among pendulous leaves of a gum) in August, and several of the smaller nests of the Little Thornbill were found in wattles during September-October.

Honeyeaters.—Five species of Honeyeaters are known to breed in the Park. The Red Wattle-bird (fairly common), the Brush Wattle-bird (less common), and the Noisy Miner (common) nest in the forks of tall gum-trees, and the White-plumed Honeyeater or Greenie (perhaps the commonest bird in the area) suspends its fragile nest amid the leaves of either gums or wattles. The fifth member of the group, the beautiful Regent Honeyeater, was an unexpected visitor; we found its bark nest, on September 28 of last year, situated at a height of about 12 ft. in the fork of a sapling, and in the nest were two Regent's eggs together with one of the Pallid Cuckoo. I removed the Cuckoo's egg and also a tell-tale piece of calico attached to the outside of the nest, and in due course one chick emerged, the second egg being addled. The birds nested twice more after that, in each case at much higher elevations. I last saw them on January 21.

Possibly one or two other Honeyeaters, such as the Yellow-wing, Spinebill, and Black-cap, also frequent the Park at times, but the five named are the only ones I have seen there to date.

Olive-backed Oriole.—Hearing the rolling note of an Oriole near the eastern fence on November 15, I followed the sound and was astonished to find a nest, containing two pretty eggs, suspended in a drooping branch only 7 ft. from the ground and within a few feet of a path. This was the lowest situation for an Oriole's nest within my knowledge—and yet the bird had a choice of many lofty trees. On November 29 there were two new-born chicks in the nest; and within a week or so both youngsters were well-grown and very noisy, calling incessantly in a curious high-pitched tone and opening their beaks at a touch to disclose gapes of bright maroon. Four days later one young bird was sitting up and calling loudly; the other babe had vanished. A week later again (December 20) the remaining young Oriole had left the nest, upon which an examination of the cradle explained the mystery of the missing babe—it was crushed into the bottom of the nest, apparently having been smothered by its brother. The nest when taken apart was found to be constructed of fibre and string. Incidentally, during the brooding period the rolling call of one or other parent was freely heard, but from the time the chicks appeared the only parental note was a harsh "charr." The family disappeared soon after the young bird left the nest. A curious sidelight was that in spite of the semi-exposed condition of the nest neither of the parental Orioles ever became at all reconciled to humanity; they flew away, and stayed away, whenever the nest was approached.

Rufous Song-lark.—Although you might expect to see an occasional Quail or Pipit in the area, the Rufous Song-lark seems to be the only ground-nesting bird to breed in the Park. Two or three pairs arrived in the spring of 1940 and stayed several months, but all searching failed to reveal a nest—the male bird was restless and noisy (apparently acting as a decoy) while the female was stealthy and silent. Eventually, on November 24, I followed a female carrying food and found a fledgling—by stepping on it.

In mid-September of 1941 Song-larks reappeared in the grassy eastern portion of the Park and soon the place was ringing with the insistent song of the male bird as he flew from tree to tree or from tree to ground. On the evening of October 19, as I was watching Wood-swallows, my wife began sauntering across grass near a path, and when a bird rose a few yards away she searched about and found two young Song-larks in a cosy nest built of fine grasses and lined with horse-hair. This was the first nest of the kind I had seen for many years. Five days later we found the nest torn out and the chicks lying mutilated and dead. Possibly the culprit was a Magpie. In later visits I watched a female Song-lark more than once, and each time she misled me by descending from a tree to a profitless spot. A very canny bird, she was also distinctly versatile—apart from seeking food on the ground, she sometimes caught flies in the air, and several times she clung to the sides of trees and also scampered along horizontal branches. The male descended near by on two occasions and darted at her, but did not attempt to do any work. His chief domestic service seems to be akin to that of the lyrebird—singing.

On November 15, after finding some 10 occupied nests (of various species) in the trees, we capped the performance by stumbling upon two nests of the Song-lark. One contained three and the other two young, new-born in each case. Both nests were extremely well hidden in grassy depressions and we should not have found either but for the hurried flushing of the parent. The second of these two nests was only about 20 yards from the spot where the first nest (of October 19) had been found. As far as could be ascertained, the chicks in both of the later nests came to grief, but as late as December 13 there were still two male birds singing lustily and one was observed chasing a female—apparently nesting was still in progress. Indeed, on January 1, between 8 and 9 p.m. (summer-time) a song-lark was still to be heard in moderate song and two females were noted carrying food and uttering irritable charring notes. These calls, by the way, appear to be more or less constant with the female Song-larks, and, like the continual chatter of the male (which is distinctly refreshing when first heard) they can become very tedious. I last saw Song-larks in the area on January 10.

The larger Black-breasted Song-lark (that bird with the extraordinary rattling voice) should also be listed for the Park, since it occurred in an adjacent vegetable-garden in 1940 and crossed the fence at times. This large Song-lark is known to be a polygamist, and I sometimes wonder if the same practice prevails with the Rufous Song-lark.

With the addition of the British Skylark in open fields close by, three larks are recorded for the area.

Wood-swallows.—Three species of these graceful "skimmers" frequented the Park last year. The Dusky Wood-swallow, most sedentary of the group, was to be seen at intervals during the cooler months, and during springtime, both in 1940 and '41, several pairs wove their flimsy nests into forks and bark-crevices of various gum-trees; one nest among bark jutting from the side of a tree was only 3 ft. from the ground. A few pairs of White-browed Wood-swallows appeared in the area in November of '40, but apparently did not nest there. In the spring of '41, however, both the White-browed and Masked Wood-swallows honoured the Park with their presence and the White-brows remained to breed.

I saw the beautiful visitors first on October 19—some 50 White-brows and perhaps 20 of the Masked species. A quarter-century ago both of these birds used to be regular October visitors to Victoria, but their movements appear to have changed considerably of late. At all events, this was the first time I had seen the Masked birds (handsome in their soft-greys and blacks) for about 20 years, and I rejoiced accordingly. You can never depend, however, on the movements of these capricious birds—four days after their arrival all the Masked Wood-swallows had disappeared and only one or two pairs of White-brows remained. A week later a fair number of White-brows returned to the area, together with one pair of the Masked birds. By mid-November the White-brows began to breed (placing their flimsy nests at various heights from perhaps 12 to 50 ft.) and one pair or another continued into the new year. Possibly 10 pairs nested in the Park between mid-November and the end of January, after which all disappeared. I regret the inconstancy of the elusive Masked birds, but it was at least refreshing to have seen the graceful forms and to have heard again the scolding chatter.

By the way, on the evening of January 10 this year I heard Dusky Wood-swallows calling plaintively and saw two clinging to the rough bark in tree-forks, as though making themselves the basis of one of the bee-like "swarms" of the species. Do the male birds camp in this manner in the breeding season?

Crested Shrike-tit.—When paying a hurried visit to the Park on the first "official" day of spring (September 1) last year, I casually imitated the whistle of the yellow-breasted Shrike-tit, with the result that a bird was revealed sitting on eggs in a nest some 20 ft. up in the top of a sapling. This meant that building began about mid-August, the earliest record I have for the species. When the chicks left the nest we had it cut down and found it to be the usual finely-woven structure of shredded bark, fibre, and spider-webbing (the very model of a tree-top cradle) with the tips of branchlets nipped off above it, apparently for the purposes of light. In mid-November a pair of Shrike-tits, possibly the same couple, was seen with young on the wing, and on November 29 I found another Shrike-tit's nest in a 25-foot-high tree-top; the spot was about 200 yards from the earlier one. A week or so later the female was again seen to be sitting on this nest and the male was tending two well-grown young in a tree nearby. The nest was still being tended on December 13. I am inclined to think that all these observations relate to the one pair of Shrike-tits, which would mean that they had three or perhaps four broods, beginning in August and continuing to December.

Whistlers, etc.—I have not known a Whistler to breed in the Park, but the female of the Golden-breast, which has a habit of wandering in solitary fashion during winter (see *Mateship With Birds*), is sometimes to be observed among the wattles in the cool months. Curiously, on August 3 of 1941 I saw a female of the Golden-breast and a female of the Rufous-breast in the one tree—close to occupied nests of the Scarlet Robin and Yellow-tailed Thornbill. The White-winged Triller has been reported from the area, but I have not seen it there. Nor have I known the Grey Thrush to breed in the Park, although a pair is sometimes seen and once (in August) a bird was observed squatting in an old nest of a Miner and singing softly meanwhile.* The Blue Jay (Cuckoo-shrike) is another visitor to the spot in late winter and spring, and doubtless it breeds in the lofty gum-trees.

Crow-shrikes.—Several pairs of White-backed Magpies are more or less permanent "over-lords" of the area. They do not seem to molest humanity—even small boys—to any extent, and they themselves are not molested in breeding-time, possibly because their stick nests are always situated near the tops of the loftiest trees. Together with the Yellow-tailed Thornbills, the Magpies are the earliest breeders, beginning at the end of July. Their smaller and equally assertive relatives, the Grey Butcher-birds, are also to be found in the Park throughout most of the year. Early in August of 1940 we watched a pair of Butcher-birds that appeared to be building two nests at the one time. They were wrenching small dry sticks off trees and discarding those that broke off short. The male bird sang in a melodious gurgle while sitting in and shaping the nest of his choice. Assuming that there was a difference of opinion between the pair as to which site should be selected, the male bird won the argument, for a week or two later the female was seen brooding eggs in the nest which he had shaped, the other nest being left unfinished.

Other Species.—Birds not discussed in the foregoing notes may be mentioned briefly, as follows: Several pairs of Bronzewing Pigeons inhabit the Park and nests may always be found in spring and summer; the bird has a habit of "freezing" when sitting on a branch, but sometimes it bobs its head and emits a curious staccato "ooming" that suggests a mechanical contrivance. The only water-birds noted were a White-necked Heron and (once) a pair of Landrails that scampered along the channel. Several pairs of Magpie-larks are constant to the area and their shapely mud nests may always be seen in springtime. No Cuckoos have been noted, but doubtless the little Bronze species and the Fantailed Cuckoo occasionally pay calls,* and the fact that the Pallid Cuckoo does so is indicated by the finding of its egg in the nest of a Honeyeater. At various times the high-pitched call of the tiny Mistletoe-bird is heard, and once in August a female was observed feeding on mistletoe berries which we had not noticed until catching sight of her; the species has not, however, been known to build its dainty nest in the reservation.

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* This "squatting" in disused nests appears to be practiced spasmodically, usually in early spring, by various birds. In August, 1942, I saw half a dozen Greenies climb into an old nest of the Magpie-lark, one after the other, and squat there for a few seconds.

Other birds on the list for the section under notice are the Kookaburra, Welcome Swallow, Silvereye, and (at the south-eastern boundary) the Blue Wren. Members of the Hawk group have been noted flying over, but I have not seen one alight. The list could be increased, no doubt, by observations in the more open, western portions of the Park.

* Since this was written I have seen (August 22) a Fantailed Cuckoo in the area. It had seized a large caterpillar and was making what my companion, Mr. L. G. Lucas, described as "a first-class job." This record brings the list of species observed at the Eastern end of the Park to 29.

BORA GROUND NEAR RUBY CREEK, N.S.W.

By C. C. TOWLE, B.A., Eastwood, N.S.W.

A Bora ground of the aborigines has been located near Ruby Creek in the extreme north-eastern part of N.S.W. (Parish of Ruby, County of Buller). It is situated partly on the western end of a ridge around which Ruby Creek meanders and partly on the low ground near the creek. The road from Stanthorpe, Queensland, to Amosfield, N.S.W., crosses Ruby Creek two miles east of the gate on the boundary between the two States. The ridge on and below which the Bora ground is situated is one mile north of this road at a distance of one and a half miles from the boundary gate. Stanthorpe, the nearest important town, is six miles to the westward.

The Bora ground consists of two circular mounds of earth connected by a path approximately 600 yards long (Fig. 1). It has been arranged in an almost due north-south direction. Both circles are in a good state of preservation, although they have not been used for very many years. Each has a well-formed opening from which the connecting path leads straight out towards the circle at the opposite end. This path, which is about five feet wide on the low ground, may even now be followed from the one circle to the other without any great difficulty for almost the whole of its length. It runs for a considerable distance in an almost straight line and then deviates slightly to avoid granite outcrops on the hillside. I am unable to state whether the width of the path is the same throughout.

The mound of earth forming the larger circle at the northern end of the arrangement is on the low ground half a mile from Ruby Creek. It is one foot in height and eight feet across. It encloses a circular area 49 feet in diameter which has been scooped out, saucer-like, to a depth of 18 inches below the level of the ground. The opening in the mound is 10 feet wide.

A short distance from this circle the path begins to ascend a gentle slope for 300 yards. From there it climbs more steeply to the top of the ridge, 300 feet above Ruby Creek. It leads straight to the entrance of the smaller circle, which has been placed on some flat ground immediately overlooking the ascent. The mound of earth forming this circle is one foot in height and six feet across. It encloses a circular area 41 feet in diameter, which has been scooped out to a depth of one foot below the level of the ground. The opening in this mound is nine feet wide.

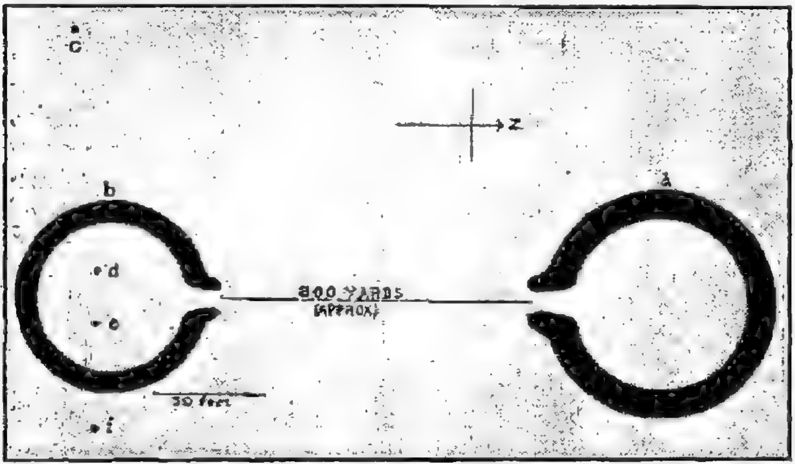

Fig. 1. Diagram showing the arrangement of the Bora Ground: a, b, circular mounds of earth; c, f, trees from which bark was removed; d, e, small clusters of stones.

Within this circle there were until recent years two small clusters of stones (Fig. 1, d, e). About four years ago a rumour spread locally that the skeletal remains of aborigines rested in the ground under the stones. Thereupon someone removed them and dug two small holes in the ground. The stones are still lying near the holes. Skeletal remains were not found.

A few feet from the circular mound and in line with the stone clusters, a sheet of bark, 6 ft. by 1½ ft., has been removed from a tree. (Fig. 1, f.) The exposed surface of the wood, which faces the north, has now almost rotted away and it is not possible to state whether any sacred designs or other markings had been cut into it. On the opposite side of the circle a knotted piece of bark has been removed from a tree. (Fig. 1, c.) It would have been a suitable receptacle for holding liquids. Mathews[1] states that amongst the Kamilaroi bark vessels were used at the Bora ceremonies for holding human blood. No other trees in the vicinity of the Bora ground show evidence of having been touched by the aborigines for any purpose.

In this brief description of the Bora ground at Ruby Creek, we can, I am sure, recognize a well laid out ground of the kind which was widely used by the aborigines for initiation ceremonies over a great part of south-eastern Australia. Several such grounds have been located in extreme south-eastern Queensland.[2] Although the ceremonies held at such sites had much in common, they varied considerably in detail from one locality to another. Many years ago, when the Bora ceremonies were held regularly, several eye-witnesses described in more or less detail the use made of the Bora grounds. Some of these descriptions are applicable to the ground at Ruby Creek.

The larger circle below the ridge is situated in the open forest. The ceremonies which took place there were usually attended by all members of the tribe present for the occasion. The path up the hill passes by many granite masses, some of which, because of their peculiar shapes or for other reasons, may have had significance in the ceremonies To the aborigines rock-masses frequently had significance in their myths or in their secret life. The circle on the top of the ridge is surrounded by dense bush, and there are some large granite outcrops in the vicinity. It is in every way a secluded place. At this circle, the secret ceremonies connected with initiations took place.

I doubt whether the two small clusters of stones in the circle on the ridge (Fig. 1, d, e) should be regarded as ceremonial objects in themselves. Each consisted of about half a dozen stones lying close together on the surface of the ground. It seems more probable that they were placed there to prop up ceremonial objects. They were lying in positions where it was customary in some localities to place such objects as decorated saplings. A drawing[3] of a Bora ground at Moreton Bay, which was made by Surveyor-General Oxley in the year 1824, shows that objects of some kind were placed in the same relative positions. Unfortunately, it does not show clearly what the objects were, but they were probably the trees referred to in the drawing as being "fantastically crowned at the summit." Mathews[1] in 1898 stated that he had seen upturned saplings with their roots intact placed in similar positions by the Kamilaroi and adjacent tribes. Tom Petrie[4] saw the same practice amongst the tribes near Brisbane and Moreton Bay in the early days of the settlement. He stated that there was one upturned tree placed in the centre of the circle.

All that now remains at Ruby Creek is, however, only a part of the total arrangements made by the aborigines for the holding of the Bora ceremonies. In preparation for such ceremonies, many sacred designs were drawn on the surface of the ground; sometimes they were cut into the trees nearby; mounds of earth of great size were formed in the likeness of the tribal heroes; and other mounds were formed to represent animals and objects sacred to the tribe. Mathews[5] records that during the intervals between ceremonies, the younger initiated men went the rounds of the Bora ground. They examined with care the different ceremonial objects, the significance of which was explained to them by the old men.

Finally, as to the significance of the ceremonies which took place at the Bora grounds, Mathews[5] says: "The Bora is a great educational institution for the admission of the youths of the tribes to the privileges, duties and obligations of manhood. . . . The youths who are initiated are carefully instructed by the old men in their traditions—their moral and religious codes—and the laws of consanguinity and intermarriage. . . ."

So far as I could ascertain, the Bora ground at Ruby Creek was used for the last time almost 50 years ago. At the present time there are trees 40 feet in height growing within the circular mounds. The soil of the locality consists of a disintegrated granite and the surface of the ground is well covered with grass. Perhaps these conditions may account to some extent for the preservation of the two mounds over such a long period of time.

Many ground-edge stone axes have been found in the neighbourhood, but not in close proximity to the Bora ground.

Acknowledgment.—I desire to thank Mr. Henry Simpson, of Amiens, Queensland, who drew my attention to the existence of the Bora ground, and who assisted me in many ways.

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CONFUSED TAXONOMY IN THE *OZOTHAMNUS* SECTION OF *HELICHRYSUM*, AND ITS RECTIFICATION

By P. F. MORRIS and J. H. WILLIS, B.Sc.,
National Herbarium of Victoria.

I. INTRODUCTION

The tall shrubby Australian "everlastings" referable to Robert Brown's genus *Ozothamnus* have some 30 representatives in the Commonwealth; one-fifth are restricted to mountain and/or alpine stations and this group has proved a stumbling block to more than one investigator—the manner in which species have been variously reduced, resurrected, synonymised or otherwise juggled is ample evidence of the endless transitions which connect them all, making positive delimitation of species extremely difficult.

The whole is apparently a complex still actively evolving, and it would seem a question either of considering the principal entities as valid species or of lumping them together as variants of a single one: in the latter instance we are still faced with the problem of what to do with those forms which grade insensibly into several other species typical of the coast and lowlands.

We think the most logical procedure is to retain specific rank for five of the six montane *Ozothamni* as described in L. Rodway's *Tasmanian Flora* (1903), viz., *Ozothamnus thyrsoideus, Backhousii, antennaria, Hookeri,* and *selaginoides*, keeping up *ledifolius* (the sixth) as a variety of the lowland *rosmarinifolius*, which was done by J. R. Tovey and P. F. Morris in *Proceedings of the Royal Society of Victoria*, vol. 34 (1922), p. 211—although *ledifolius* has in general shorter, stiffer, smoother leaves and wider flower heads than *rosmarinifolius*, we find the type specimens of each too similar for specific separation—and giving due regard to correct citation when these epithets are transferred to the genus *Helichrysum*.

II. NAMES TO BE REJECTED (LATER HOMONYMS, ETC.)

In 1923 Tovey and Morris published in the above-named journal four alterations to the nomenclature of the *Ozothamnus* group, as follow:

1. *Helichrysum Backhousii*, F.v.M. 1866
   to *H. cuneifolium* (D.C.) *comb. nov.* (based on *Cassinia cuneifolia* 1837).
2. *Helichrysum baccharoides*, F.v.M. 1886 (misprint for 1866)
   to *H. lepidophyllum* (D.C.) *comb. nov.* (based on *Baccharis lepidophylla* 1837).

3. *Helichrysum cuneifolium*, F.v.M. 1866
   to *H. oblongifolium, comb. nov.* (misprint for "nom. nov.").
4. *Helichrysum lepidophyllum*, F.v.M. 1866
   to *H. Steetzianum, comb. nov.* (misprint for "nom. nov.").

Admittedly, the 1905 Rules of the Vienna Botanical Congress, upon which the authors based their findings, did not give such patent direction in the matter of homonyms as article 61 of the 1930 Rules of Nomenclature, which unequivocally states that later homonyms are illegitimate and must be rejected if the original combination were validly published.

In cases 3 and 4, the epithets "cuneifolium" and "lepidophyllum" (West Aust.) were quite validly published and applied under *Helichrysum* by Mueller in Bentham's *Flora Australiensis*, vol. 3 (1866), and they must on no account be superseded; the new names of oblongifolium and Steetzianum respectively cannot be upheld.

In case 1, the new combination of *H. cuneifolium* (D.C.) Tovey and Morris is a later homonym of the properly published *H. cuneifolium*, F.v.M. (an entirely different plant) and must be dropped in favour of *H. Backhousii* (Hk.f.) F.v.M. ex Benth.

In case 2, the position is similar and the later homonym, *H. lepidophyllum* (D.C.) Tovey and Morris, cannot stand. This plant was published in *Flora Australiensis* as *H. baccharoides* (nom. nov.), but there is a still older epithet available, viz., "*Hookeri*" (from *Ozothamnus Hookeri*, Sond. 1852). Druce made the correct combination *Helichrysum Hookeri* in 1917 and his binary must be accepted.

III. DISCUSSION OF CERTAIN SPECIES AND SPECIMENS, WITH DESCRIPTION OF A NEW VARIETY

In the Melbourne Herbarium there is only one sheet which agrees perfectly with the type fragment of Labillardière's "*Eupatorium rosmarinifolium*" housed there (cobwebby rugulose leaves and narrow heads); it is a C. Stuart (1857) collection from Recherche Bay, Tasmania—not far from the actual type locality.

As one ascends Mount Wellington from the Derwent estuary, there seems to be a gradual transition from *Helichrysum rosmarinifolium* to variety *ledifolium* at the summit, where climatic inclemency may account for the thicker and more rigid foliage of the latter. We have no true *ledifolium* in Victoria, and material so determined at the State Herbarium is referable to the almost round-leaved *H. Backhousii*, which is frequent on Hotham, Feathertop, and most other high alps, although the first record (1887) was from the head of the Loddon River in western

Victoria, at a considerably lower elevation. Despite Ewart's omission of *Backhousii* from the *Flora of Victoria* (1930) two forms occur here, as well as in Tasmania—the typical with rather broad heads of pale woolly bracts, and a form with narrow glabrescent heads of ruddy purple hue.

Ozothamnus ericifolius was reduced to a variety of *O. rosmarinifolius* by Rodway (1903), yet the Mount Wellington specimens which he forwarded to Melbourne, as typical, are the counterpart of type var. *ledifolium*; Hooker's figure of *O. ericifolius* in *Flora Tasmaniae* (1860) also appears to be no more than a rather short-leaved form of *ledifolium*, and we therefore feel justified in merging the former with the latter variety.

Common in southern Tasmania, whence Stuart secured excellent material from Southport district (Nos. 1430 and 1431, Feb., 1856), is a variant of *rosmarinifolium*, with smaller heads of a beautiful rosy-purple shade and very narrow, scabrid leaves. Stuart wrote "var. roseus" on his label, and his plant is unquestionably the var. *brevifolia*, well portrayed in colour by Joseph Hooker (plate 54, *Flora Tasmaniae*), who states: "may be the *Ozothamnus purpurascens* D.C Prodr. IV. 165, but the leaves are not described as *minutely hispid*." Hooker's caution impelled him to create a new epithet, "brevifolia" rather than accept De Candolle's *purpurascens*, the Gunn type of which he had apparently never seen. We have not seen Gunn's collection either, but are convinced that it was the very purplish form which Stuart and Milligan discovered later—De Candolle could easily have overlooked the leaf asperities.

In Victoria the same scabrid variety occurs at Lilydale, Curdie's River (Otway), Genoa (W. Hunter, Jan., 1942), Delegete River, and probably other Gippsland streams near the coast, but with us leaves are longer and the purple colouration of the involucral bracts seems entirely to be lacking; nevertheless, our only choice is to keep up the varietal name *purpurascens* (D.C.) Benth., even though inept, for the representative of *Helichrysum rosmarinifolium* in this State: what we have been calling "variety purpurascens" here is a mountain colour-form either of *H. thyrsoideum* or of *H. Backhousii* (mentioned already).

We now establish the binomial *Helichrysum thyrsoideum* (D.C.) comb. nov.; this plant is recognizable on account of its smooth, linear, dark green leaves, drooping habit, copious snow-white lateral flower clusters which tend to be secund, and long, petaloid tips to the upper involucral bracts (quite half the length of each head is white and petaloid). *H. thyrsoideum* is widely distributed from lowland stations to the highest alps in Tasmania, Victoria (being the "rosmarinifolium" as generally understood), and New South Wales, where it extends at least as far north as Jenolan Caves; the trusses of blossom carried to the very tips of gracefully weeping branches suggest "Cascade Everlasting" as an appropriate vernacular.

Helichrysum Hookeri (Sond.) Druce, "Alpine Everlasting," is frequent above 4,500 feet, in the three south-eastern States, but on Tasmanian mountains occurs a curious form with slightly larger, less appressed, and decidedly woolly leaves, a sheet of which from Sieber's Herbarium (collector Theodore Siemssen, V.D.L. 1838) carries the following handwriting.

> *"proxima Ozothamno lepidophyllo, Hk.f., a quo differre videtur: folius paullo majoribus, minus arcte appressis."*

Here we have an adequate Latin diagnosis for a new variety of *H. Hookeri*, to which we give the name var. *expansifolium*, on account of its more spreading leaves; as type we choose Dr. C. S. Sutton's collection No. 2661 from Cradle Mountain, Feb., 1919—incorrectly labelled *H. rosmarinifolium* var. *ericifolium* in the National Herbarium of Victoria.

A particularly interesting sheet at Melbourne bears specimens from Munyang Mountains (N.S.W.), Bogong and Mount Wellington (Victoria), though from which place Mueller collected which sample is unfortunately not indicated. He called them all "*purpurascens*," but one is undoubtedly *H. Backhousii*, while the other two bear a strong resemblance to *H. Hookeri*, var. *expansifolium* (var. nov.) from Tasmania (albeit with prominent ventral leaf-ribs); we wonder if they represent a condition intermediate between *Backhousii* and *Hookeri*?—only further observation in the field can settle this.

Yet another problem: what to do with *Helichrysum Gunnii*, of northern Tasmania? Rodway keys out the "Coast Everlasting" *H. cinereum* from *H. Gunnii* on the criterion of "*bracts without white spreading tips*," but many true *cinereum* collections from Victorian shores exhibit quite prominent petaloid extensions to the inner involucral bracts. Hooker remarks: "much resembles *O. turbinatus* D.C. (now relegated to synonymy under *H. cinereum* (Lab.) F.v.M.), but capitula are smaller and narrower, the leaves sharp-pointed, and the radiating apices of the inner involucral scales longer," and we cannot avoid the opinion that a critical examination of Gunn's type (sand hummocks at Georgetown) would reveal this species as differing in no essential detail from the abundant and variable *cinereum*.

The only specimen labelled "*H. Gunnii*" (by Mueller) at Melbourne is from Southport; the leaves are by no means "sharp-pointed," and the small heads definitely remind one of *rosmarinifolium*—it is probably another of those innumerable transition forms which are most difficult to place.

We feel that the foregoing remarks should help to clear the way for a more accurate tabulation of the section *Ozothamnus*. and the corrections necessary in Ewart's *Flora of Victoria*, p. 1139, are:

1. *For Helichrysum oblongifolium* Tovey and Morris, read *H. cuneifolium*. F.v.M.
2. For *H. lepidophyllum* (D.C.) Tovey and Morris, read *H. Hookeri* (Sond.) Druce.
3. Add *H. Backhousii* (Hk.f.) F.v.M. ex Benth., "Round-leaf Everlasting." (Alpine, often with purplish capitula.)
4. Add *H. thyrsoideum* (D.C.) comb. nov., "Cascade Everlasting." (Hitherto passing as *rosmarinifolium* in Victoria.)
5. Restrict *H. rosmarinifolium* (Lab.) Less in Victoria to the variety *purpurascens* (D.C.) Benth.—a lowland plant, which is rarely "purple" this side of Bass Strait.

SHOULD CORMORANTS BE ATTACKED?

Recent paragraphs in Melbourne newspapers indicate that Northcote anglers are planning a drive on Cormorants along the Yarra upstream from Heidelberg, and are to approach the Fisheries and Game Department for assistance in obtaining ammunition. "There is very little doubt," the anglers say, "that Cormorants are taking a heavy toll of fish."

The trouble about all such charges is that they are based merely on guesswork. It is high time that fishermen gave over these slipshod methods and examined the Cormorant problem in the light of actual research. They might well begin by studying the report made on the subject by Mr. G. Mack, of the National Museum, in No. 12 of the *Memoirs* of the Museum. After examination of a large number of Cormorants' stomachs and consideration of other factors, Mr. Mack reached the conclusion that neither the Cormorant nor any other particular organism (apart from man) is responsible for the deterioration of fish in the Gippsland Lakes. It all gets back to an upsetting of the natural balance. "So long as we continue in our ways," Mr. Mack says, "tinkering occasionally with effects instead of dealing with causes, so long will we continue to reap disaster for ourselves and those who follow."

Having studied Mr. Mack's report, the anglers might then turn to an article published by Dr. D. L. Serventy in the *Emu* of November, 1938. In this they will find detailed records of the results of an examination of the food of Cormorants in W.A. In all, 441 birds (representing four species) were examined, and it was found in almost every instance that valuable estuarine food fishes were not preyed upon, but that the birds' food consisted very largely of the non-edible but abundant small fishes like the percoid gobbleguts (*Apogon*), the gobies, hardyhead, small cobbler, and bullrout. This, of course, is not due to conscious selection on the part of the birds, but to the fact that they take the species which are caught with the least effort and which are present in the greatest abundance. Having shown that fishes which form the mainstay of the Cormorant population in the area examined are not of economic importance, Dr. Serventy adds: "It is possible that the birds are doing material good. This is quite apart from the function which they may perform as scavengers in removing weak or sickly fishes."

Such evidence, it may be suggested, is rather more substantial than the airy charges of Northcote anglers. A.H.C.

A NEW SPECIES OF SCHIZAEA

By N. A. WAKEFIELD, Genoa, Victoria.

Schizaea asperula sp.nov. Frondes fertiles indivisae vel furcatae vel dichotomae, 1-8 capita fertilia; frondes steriles saepe divisiores. Frondium segmenta plana asperula. Pinnulae soriferae erectae appressae angustilineares ciliatae.

Distribution: New South Wales, Victoria, New Zealand; and reported from Tasmania, New Caledonia and South Australia.

Typical plant about 9 inches high, densely tufted, with several short dichotomously divided fan-shaped barren fronds (with up to 16 tips), and a few longer somewhat linear fertile fronds which are twice or three bifid so as to bear up to eight soriferous heads. Frond segments flattened, armed with numerous tiny short upward-pointing whitish prickles, especially on barren fronds. Soriferous heads ¼ to ½ in. long and ⅙ to ¼ in. broad; soriferous pinnules few (5 to 10 pairs), entire or rarely bifid, erect and appressed in two rows and fringed with long fine cilia. Sporangia small and numerous. Rarely, plants are reduced to a few undivided or bifid fertile fronds with larger, more irregularly-formed heads.

Fairly plentiful throughout southern Croajingolong on flats covered with *Xanthorrhoea hastilis* (Genoa, Betka, Wingan, Thurra and McKenzie Rivers, Newton's Creek and Marlo); and at Bens Creek, S.E. N.S.W.—N. A. Wakefield, 1938-41. (Part of this type collection has been lodged at the Melbourne National Herbarium.) Also—Victoria: Port Phillip, Howitt, 1887; Brighton, Mueller, 1852; do., 1884; C. French; Sandringham, June, 1895, and Anglesea, May, 1935, C. French, Jnr.; Mentone, Reader, March, 1885; River Yarra, Minchin; Mount William, D. Sullivan, 1882. New South Wales: Towards Twofold Bay and Mount Imlay, F. Mueller, Sept., 1860; Port Jackson, Sieber, R. Brown; Clarence River, T. Wilcox. New Zealand: North Island, Andrew Sinclair. (See also below.) (The above records are based on Melbourne National Herbarium specimens.) South Australia: Reported from Encounter Bay.

From Sydney National Herbarium, Miss A. T. Melvaine wrote in March, 1941: "A number of other specimens labelled *bifida* in our collections are a good match for your uncertain specimens, and their range is from Tasmania to Sydney, and in New Caledonia and New Zealand."

Synonyms: "*Schizaea dichotoma* var *bifida*" F. Mueller, fig., *Key to the System of Victorian Plants*, vol. 2 (1885), p. 132; and listed on p. 59 as "*S. bifida* (*S. dichotoma* partly) . . . stalks of the fertile fronds once, twice or oftener divided into linear rather flat segments." "*Schizaea bifida*, fronds rough and forked," A. J. Ewart, *Flora of Victoria* (1930). "*S. bifida*, . . fronds more or less rough . . . unbranched specimens distinguished from *S. fistulosa* by the rough feel of the 'stalks'," *New Zealand Ferns*, by H. B. Dobbie, p. 356, fig. p. 357; Cheeseman, *Manual New Zealand Flora*. "*S. bifida*" (partim) Rodway in *Flora of Tasmania*. "*S. bifida*" N. A. Wakefield, fig., *Vic. Nat.* LVII, p. 66, July, 1940. Not *S. bifida* (Willd.) Sw., nor *S. Dichotoma* (L.) Sm.

The true identity of *S. bifida* is discussed hereunder:

The earliest description available in Australia is in *Synopsis Filicum* (1806), in which Swartz wrote: "*S. bifida, fronde nuda filiformi compressa bifida, paribus appendicularum secundis erectiusculis subquindenis*; Willd. *Acrostichum dichotomum* Cav. *prael.* 1801. no. 584. Willd. (*Act. el. Mogunt. Erf.* 1802) t.3 f.3 *Nova Hollandia.*" Bentham enlarged on this outline in vol. 7 of *Flora Australiensis* (1877), in which he described *S. bifida* as "Fronds terete, 9-18 in. high, once forked at or below the middle or rarely undivided. Spike of the fertile ones ½ to ⅔ in. long, the soriferous pinnules very numerous and closely packed, narrow-linear, 3-4 lines long, fringed with long cilia. Sporecases often 20 pairs smaller than in *S. fistulosa.*"

and numerous. Rarely, plants are reduced to a few undivided or bifid

S. bifida ranges from Queensland through New South Wales and Victoria to Tasmania (and possibly South Australia). Illustrated under its right name by Bailey in *Lithographs of Queensland Ferns*, and as *S. fistulosa* by N. A. Wakefield, *Vic. Nat.*, July, 1940. Western Victorian and Tasmanian specimens of *S. bifida* have fronds only 2-3 ins. high and undivided, while in more congenial conditions, fronds are up to 2 ft. high and sometimes twice bifid. Both species are very variable throughout their respective ranges, but can be identified satisfactorily by the above descriptions. (See also *Vic. Nat.*, July, 1940.)

Mueller apparently considered the present *S. asperula* as a form of *S. dichotoma*, which is in some ways very similar but has slightly smaller soriferous heads and flatter frond segments; the two are very distinct in habit and range. In discussing the new form, Miss Melvaine wrote: "At first I regarded it as a depauperate southern form of *S. dichotoma*, but the occurrence of typical *dichotoma* as well as this uncertain form both in the suburbs of Sydney discredit this opinion."

The Australian *S. dichotoma* (as figured in "Liths. of Q'land Ferns" and as described in *Fl. Austr.*) ranges from Sydney to Queensland and North Australia, and has large fan-shaped fronds repeatedly dichotomous so as to bear up to 100 odd soriferous heads when fertile. The other Victorian species, *S. fistulosa*, has fine terete undivided fronds with long narrow heads bearing numerous short denticulate-fringed pinnules. (See *Fl. Aust.* for description and Dobbie's *N. Zeal. Ferns* for figure.)

THE WONDER-LILY OF BEENAK

By JAMES H. WILLIS, National Herbarium, Melbourne

"Old Beenak is a basket upside down," sings Mrs. Olga Waller in her booklet of the Dandenong aboriginal legends, and truly enough naturalists have picked up more than one treasure (rare plants and precious stones) scattered around the edge of the "basket." Beenak Parish sprawls over a granitic mass, dividing off the Yarra, Latrobe and Bunyip waters, ten or more miles north-east of Gembrook. The rainfall is high (about 50 in.) and the whole area dissected by steep gullies which, until the tragic fires of 1926, 1932 and 1939, were covered with magnificent stands of large-size eucalypts—Ash, Silvertop and Messmate.

Even to-day relics of former grandeur survive in sheltered pockets. Here flourish venerable old beech trees (*Nothofagus*) draped to the ground with epiphytic mosses and hepatics, their massive trunks supporting half a dozen remarkable fungi that I have seen upon no other host—e.g., spongy *Polyporus pulcherrimus* is a gem of fieriest crimson, while *Cyttaria Gunnii* hangs like clusters of white grapes from the smaller branches; here also, on wet sand, spangled with mica flecks, near the beech-shaded margin of streams, grow pygmy forests of the palm-like mosses, *Hypnodendron* and *Mniodendron*, heightened now and again by fronds of the uncommon Hairy Shield Fern (*Polystichum hispidum*). Our one tree Grevillea (*G. Barklyana*) is a rarity endemic along the Bunyip tributaries just east of Beenak, while the lovely Mountain Beauty, Balm Mint-bush, Fairy Fan-flower, Fieldia, Truncate Phebalium, and Pink Boronia (loftiest in the genus) are all found hereabouts.

Small wonder that my pulse quickened when a Forestry appointment brought me to live and labour near these mountains for three years! Every trip out Beenak way might yield a botanical surprise, and most of them did; but all my excitements fade in comparison with the discovery of *ASTELIA NERVOSA*. Tucked away in cool boggy heads of a few myrtle-beech gullies, colonies of this big lily had for almost a century eluded the eye of botanists, Mueller included. Our only other Astelia is a high alpine of insignificant proportions, but the Beenak plant sometimes attains a height of six feet, its broad-channeled, bright green foliage invested beneath with silvery wool. At berry time, as I first came across it in McCrae's Creek (near the Beenak tin mine), it is indeed a glorious spectacle; the persistent flowers enlarge during fruition and when the ripe, vivid orange berries fall they reveal fleshy chalices—pale yellow and "eyed" like primrose blooms. Excepting the arborescent Grass-trees (*Xanthorrhœa*), no other member of Victorian *Liliaceæ* can approach it in stature.

Realizing the affinities of my plant with the larger Astelias inhabiting New Zealand tussock grasslands, I forwarded ample material to the Dominion botanist, who pronounced it distinct from any form known to him. Dr. Skottsberg, Swedish monographer of this circum-Antarctic genus, later handled dried specimens and wrote, "should be classified as a distinct variety of *A. nervosa*, not as a new species"; he also drew attention to the close connection between the new Victorian record and *A. nervosa var. chathamica*—a long call from Chatham Islands to Beenak! and there is certainly no other Australian locality on record. One may be forgiven for entertaining a suspicion that the plant has been introduced from its true New Zealand home and is now an escape in our mountain forest, but such a possibility is countered by the distinct morphological characters (chiefly in female flowers and seeds), the definite habitat in separated colonies, and the fact that old settlers of Beenak Parish remember it as being abundant in virgin gullies when they pioneered the area last century. Nevertheless, such a very isolated outpost of a predominantly New Zealand type defies explanation and is in truth conducive to wonder: there remains the tantalizing query, "Whence?"

Altogether I have located colonies in six different creeks, the most impressive being high up in the vicinity of "7-acre rock" at 2,300 feet. After much deliberation, I published an account of the Tall Astelia in Kew *Bulletin* (No. 4, 1939), ascribing to it the varietal epithet of "*australiana*"—apparently the only large species in the Commonwealth. The type specimen, description, a photo. *in situ*, and a good water-colour portrayal from nature were exhibited at the August meeting of this Club.

OVERSEAS CHRISTMAS MAIL

The Deputy-Director, Posts and Telegraphs, urges readers to post Christmas mail to friends and relatives in the British Isles as early as possible and not later than the first of October. Particular care should be given to the packing of parcels to ensure arrival in good condition and the address should be prominently written on the wrapper. Gift parcels to civilians in the British Isles must not exceed 5 lb. in weight and not more than 2 lb. of any one foodstuff may be enclosed in a parcel. A Customs declaration must accompany each parcel and complete details of the contents, such as weight and value of each item, must be given. All packets and parcels for overseas destinations must be handed in at a Post Office counter.

DINGO AS POULTRY THIEF

It is not generally known that dingoes (like foxes) are partial to poultry. Mrs. William Hill relates the following incident:—

Ducks were penned in an enclosure containing a spring door: that is to say, if the door was shoved in and then released it would instantly slam shut. One morning a dingo was discovered curled up in a corner of the enclosure with several dead and some partly devoured ducks scattered about therein. Needless to say, that dingo did not come out alive. I have heard of dingoes killing calves, and have also been informed of them attacking cows when calving.

HARRY BURRELL, Sydney

LIST OF EXCURSIONS, SEPTEMBER, 1942-AUGUST, 1943

1942	Place.	Subject.	Leader.
Sept.	12—Botanic Gardens	Wattles and Legumes	Mr. P. Bibby
,,	26—North Balwyn Sanctuary	Birds, Mammals, Violets	Mr. W. R. Maughan Mr. A. S. Chalk
Oct.	10—Frankston-Langwarrin	General	Mr. C. French Dr. C. S. Sutton
,,	17—Bayswater-Ringwood	Flora and Birds (B.O.C.)	Mr. N. Lothian Mr. A. S. Chalk
,,	31—Burnley	Grasses (combined with B.O.C.)	Mr. P. F. Morris
*Nov.	8—Lilydale-Mt. Evelyn-Lilydale	General	Mr. A. C. Frostick Mr. R. G. Painter
,,	14—North Kew	Pond Life	Miss J. W. Raff
,,	21—Eltham	Birds (B.O.C.)	Mr. A. S. Chalk
*Dec.	6—Rickett's Point	General	Mr. P. C. Morrison
,,	12—Botanic Gardens	Australian Dwarf Shrubs	Mr. H. C. E. Stewart
1943.			
Jan.	9—Ferntree Gully	Ferns and Birds	Mr. A. J. Swaby
,,	?—Altona	Shore-life, Wading Birds (B.O.C.)	Mr. & Mrs. J. J. Freame
Feb.	6—Lilydale	Geology	Mr. F. S. Colliver
,,	13—Domain	Eucalypts	Mr. C. H. Shewan
,,	20—Blackburn Lake	Birds (B.O.C.)	Mr. A. S. Chalk
Mar.	6—River Yarra	Social Afternoon on Ferry	Mr. H. P. Dickins
,,	20—Botanic Gardens	Birds	Mrs. V. H. Miller
Apr.	4—Sth. Morang-Hurstbridge	General	Mr. F. S. Colliver Mr. N. Lothian
,,	24—Keilor	Geology and Birds (B.O.C.)	Mr. A. C. Frostick Mr. A. H. Chisholm
May	1—Melbourne	Building Stones	Mr. A. C. Frostick
,,	13—Sherbrooke Forest	Fungi and Lichens	Mr. J. H. Willis Mr. P. Bibby
,,	22—Royal Park	Geology	Mr. F. S. Colliver
June	5—Sherbrooke	Lyrebirds	Mr. A. H. Chisholm
,,	12—Botanic Gardens	Australian Arboreal Vegetation	Mr. H. C. E. Stewart
,,	26—Zoological Gardens	Classification of Animals	Mr. P. C. Morrison Mr. F. S. Colliver
July	3—Herbarium	Preservation of Botanical Material	Mr. A. W. Jessep
,,	17—National Museum	Anthropology	Mr. A. S. Kenyon
,,	24—National Museum	Conchology	Mr. C. Gabriel
Aug	7—National Museum	Bird Classification	Mr. G. Mack
,,	21—Frankston	General	Mr. J. H. Willis Mr. P. Bibby

In addition, two evening excursions dealing with Astronomy will take place.

*Denotes a full-day Sunday excursion.

The Victorian Naturalist

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PROCEEDINGS

The ordinary monthly meeting of the Club was held on Monday, September 14, 1942. The President (Mr. P. Crosbie Morrison) presided and there was a good attendance of members and friends.

SUBJECT FOR THE EVENING

An illustrated lecture, "Beneficial Insects at Home and Abroad," was given by Miss J. W. Raff, M.Sc., F.E.S. Miss Raff's address was cordially appreciated. (A summary appears in this issue.)

BUSINESS FROM THE MINUTES

(a) It was announced that short paragraphs of general natural history interest were required.

(b) Attention was drawn to the note in the current *Naturalist* regarding cormorants. This note was published by request of the Committee.

CORRESPONDENCE

(a) Letter from Mr. D. H. Fleay, thanking members for kindnesses shown to himself and Mrs. Fleay at the presentation of the Australian Natural History Medallion.

(b) Letter from Mr. G. N. Hyam, thanking the Club for floral tribute sent to the funeral of Mrs. Hyam.

REPORTS OF EXCURSIONS

Reports of Excursions were given as follows: Clarinda, Mrs. F. H. Salau; Ivanhoe, Mr. Ivo C. Hammett; Botanic Gardens, Mr. P. Bibby.

ELECTION OF MEMBERS

The following were duly elected: As Ordinary Members, Miss June Jeffress, Dr. F. Coran, Mr. S. Chambers; as Associate Member, Owen Singleton.

GENERAL BUSINESS

Forthcoming Excursions.—These were spoken to by their respective leaders.

EXHIBITS

Mr. R. G. Painter—Twenty-three species of garden-grown native plants, including *Acacia Drummondii, A. leprosa, Boronia heterophylla, B. megastigma, Brachysema lanceolata Dampiera lanceolata, Goodia lotifolia, Grevillea lanigera, G. lavandulacea, G. oleoides* var. *undulacea, G. rosmarinifolia, G. Thelemanniana, Hardenbergia Comptoniana H. monophylla, Micromyrtus ciliatus, Olearia flavescens, Phebalium squameum, Pultenaea Gunnii, P. retusa, Pimelea flava, P. flava, P. spathulata, Rubus rosaefolius floreplено, Eugenia myrtifolia variegata.*

Mr. C. French—Seven species of garden-grown native flowers, also original water-colour drawings (by C. C. Brittlebank) of insects belonging to the genus *Tragocerus,* and including *T. lepidopterus,* one of the finest Victorian insects from the Alps.

Mr. H. P. Dickins—Paintings of native flowers grown by members of the Club.

Mr. J. H. Willis—*Septobasidium Clelandii,* a remarkable feathery fungus growing on scale insects imbedded under the bark of the common Tea-tree or Manuka. Two new "Vegetable Caterpillars" for Victoria; the first (*Cordyceps Robertsii*) previously known only from New Zealand and Tasmania, the other apparently new to science. (Both collected by P. Fisch and family, Doncaster.)

Mr. V. H. Miller—Orchids in Bloom: *Dendrobium Beckleri, D. elongatum, D. falcorostrum, D. tetragonum, Cypripedium Harrisianum.*

HEATHLAND EXCURSION

The excursion to the Clarinda heathlands on Saturday, August 22, was attended by about sixty members and friends. The day was reasonably fine. *Acacia prominens* in full bloom was very attractive, other varieties being less advanced. *Kunzea peduncularis* grows abundantly here, but was not yet in bloom. A fungus-covered pine log and stump were much admired. While traversing the heathlands several varieties of wildflowers were collected, although it was roughly a month too early for a comprehensive display.

The main species found in bloom were *Hibbertia fasciculata, H. sericea, Correa rubra* var. *virens, Hovea heterophylla, Epacris impressa. Platylobium obtusangulum, Helichrysum scoparium, H. semipapposum, Craspedia Richea, Daviesia ulicina, Kennedya prostrata, Ricinocarpus pinifolius, Pimelia humilis, P. phylicoides, Microseris scapigera, Acacia longifolia. A. salicina. A. stricta, A. diffusa, A. verticillata,* and *Isopogon ceratophyllus.*

Orchids were represented by *Pterostylis nutans, P. concinna, Acianthus reniformis,* and *Corybas diemenicus.*

On the damper section of the collecting ground *Gleichenia circinata*—coral fern—is growing well, but only a small portion was examined by some members.

F. H. SALAU.

BENEFICIAL INSECTS

(Portion of address to September meeting of F.N.C.)

By Janet W. Raff, M.Sc., F.R.E.S.

A general idea among many is that all insects are destructive and therefore must be regarded as non-beneficial. This idea is due, no doubt, to the great losses that have at times been sustained by growers of orchard trees and crops, as well as by holders of small garden plots.

Let us look, however, at insects, as they are in nature in an undisturbed condition, and one will soon realize how far from the truth this idea is.

Immense numbers of insects are used as food by birds and other animals, and the aquatic larvae of many kinds form the chief food of fishes. It is to man, however, that insects have been and still are of direct use. Our aborigines knew the value of such forms as bogong moths, honey-pot ants, witchety grubs, manna-producing insects and many others. Civilized man, in times gone by, has made direct use of more than one kind, as for instance the cochineal mealy-bug, a sucking type of insect feeding naturally on Prickly Pear. The dried bodies of the females, when crushed, yielded the cochineal colouring matter used for culinary purposes. The lac insect, a type of scale insect infesting certain trees in tropical India, was at one time used for the production of shellac, this particular form yielding more waxy material than most other scale insects. Cantharadine, another insect product, has been used for medicinal purposes, the material being secured from the crushed bodies of the cantharid beetle. Chief among insects used for man's benefit, however, are, of course, the silkworm and the honey-bee, the latter of major importance not only for honey production but for its value in pollinating flowers.

The orchardist is indeed indebted to insects for their useful habits in more ways than is at first realized. This may be illustrated by quoting the work of the minute fig-wasp (*Blastophaga*) in the cultivation of figs for the dried fig industry. *Blastophaga* is a minute chalcid wasp that feeds and spends its life within the fruit of the wild fig or caprifig in the Orient, and the story of how it came to be used in America and other countries is one of great interest.

In developing the Smyrna fig industry in California, it was found that as the trees began to bear, the fruit fell before reaching maturity. It was then recollected that in the Orient the custom was to have branches of the caprifig tied to the commercial varieties, so Smyrna was visited, and caprifig trees were obtained and taken to California, where they were established. But still the commercial figs dropped. On further investigation it was realized that the caprifigs were of use only if they contained the fig wasp. Now, to appreciate the use of the wasp, it is necessary to be aware of the fact that the Smyrna fig contains in the interior of its fleshy receptacle (the edible portion of the fig) practically female flowers only, while the wild or caprifig contains both male and female flowers.

The wasp carries out its whole life-history in the caprifig, actually developing within the little female flowers which are grouped, incidentally, near the stalk end of the fig. The wasps emerge from the flowers in the receptacle, move about the inside of the fig and endeavour to escape through the opening at the "eye" or apex of the fruit. On doing so they become covered with pollen from the staminate flowers which are grouped near the apex. On leaving the fig they fly about and enter Smyrna figs, searching for a suitable place in which to oviposit. In this way they naturally carry in pollen and so effect fertilization of the fig flowers, although these Smyrna flowers are not suitable for the wasp to oviposit in. Pollination is apparently essential for the production of large fleshy fruits suitable for the dried fig industry, so when the fig wasp became established in California, there was no further trouble in the production of fleshy figs. *Blastophaga* is therefore of inestimable value to the commercial grower, and most countries, Australia included, are now using it.

Another illustration of a wasp being of importance to the orchardist is the case of the chalcid parasite of the woolly aphis of the apple. As is well known, this aphis is one of the worst pests wherever the apple is grown, and it is one of the most difficult to control by spraying, on account of its woolly covering. In American orchards, among the beneficial insects that appeared to be naturally assisting in reducing the numbers of this pest was the minute wasp *Aphelinus*. It was therefore introduced, about 1922, into New Zealand and liberated in the orchards; there it became established and has exercised a wonderful control over the woolly aphis. The wasps lay their eggs in the bodies of the aphis, and the young feed there, reducing the hosts to mere hardened black "shells."

Aphelinus was later brought from New Zealand to Australia with similar success. The apple-grower has now only to apply to the State Agricultural Departments for the parasite, stating the number of trees in his orchard, and the extent of the aphis infestation, when apple-twigs carrying parasitized aphis will be forwarded to him. These twigs should be hung or placed in tins of damp sand about the orchard, and in due time *Aphelinus* adults will emerge from the dried bodies of the aphis. They fly about searching for fresh woolly colonies on which to oviposit and so begin another generation. This minute chalcid wasp has proved of great value to the apple-grower.

When we come to consider the types of beneficial insects generally seen in gardens, orchards, or forests, we can place them roughly into two groups, viz., the predaceous type and the truly parasitic type. Of the former, one immediately thinks of such forms as the hover fly or Syrphid, the ladybird, the praying mantis, and the green lace-wings; of the latter, ichneumonids, braconids, and chalcids such as *Aphelinus*. The predaceous forms are among the most useful in destroying large numbers of destructive insects. Thus the common hover-fly (the brown- and yellow-banded fly seen hovering over plants in the sunshine) lays its eggs among aphis colonies. On hatching, the maggot seeks out the host and sucks it dry, and in this way takes toll of large numbers of harmful insects.

The ladybird, both in its adult and larval stage, also reduces considerably the numbers of aphis, mealy-bugs and scale insects, and entomologists have taken advantage of their useful habits by introducing them into foreign countries to assist in the control of orchard pests. The introduction and establishment of the Australian ladybird, *Cryptolaemus*, into California to cope with the citrus mealy-bug pest, met with great success, and the methods adopted to breed up large numbers of the ladybird for liberation in the orchards may be mentioned here. The requirements for such breeding would be (a) large supplies of available host plant, (b) facilities for producing heavy infestations of the particular pest, and (c) quick breeding methods, with mass production of the beneficial insect which is to feed on the pest.

It was found in California that potato sprouts acted as a suitable host plant for the citrus mealy-bug. Long rooms were fitted with racks on which were placed trays of sprouting potatoes, these rooms being kept at the necessary humidity and temperature. When the sprouts had reached a suitable stage, they were infested with the mealy-bug, which was allowed to develop, and when the infestation was considered sufficiently heavy, *Cryptolaemus* ladybirds were introduced. These immediately laid eggs among the host insects, and the larvae, on hatching, fed on the mealy-bugs. When full-grown they found shelter for pupation in bands of hessian material that had been provided for the purpose: these were attached to the front of the trays and other suitable positions. Development continued successfully, and when the beetles emerged from the pupal stage, they were attracted by light to a cloth-covered window where they were easily collected. For distribution to the orchardist, gelatine capsules were used as containers, each holding ten ladybirds. The numbers liberated would depend upon the number of citrus trees and the extent of the mealy-bug infestation.

This mass production of *Cryptolaemus* has proved extremely successful and has given the citrus growers in California valuable aid in combating the mealy-bug pest.

ACROSS THE OWEN STANLEY RANGE*

By C. C. SIMPSON

The chief object of my journey into the bush from Port Moresby was to pass over the Owen Stanley range of mountains and reach Kokoda, a Government station in the Northern Division. The Owen Stanley Range separates the Northern Division from the Central Division of British New Guinea.

My party consisted of twenty boys from the Sogeri and Moroka districts, who accompanied me through the whole of my travels. I had also, when marching, thirty carriers, whom we obtained locally in the different districts we visited. The carriers were chiefly women, some of whom carried a baby, in addition to a load of thirty pounds, over steep and difficult hills. For the first few days we had about fifty people, in addition, following us for pleasure.

On October 28, 1905, we started into the bush from Mr. Ballantine's coffee plantation in Sogeri district, about thirty-five miles east and slightly north of Port Moresby, and 1,600 feet above sea-level. Our destination was a cave at the base of Mount Oriori, in a north-easterly direction, the cave probably being about 3,500 feet above sea-level. By taking this direction we kept well to the east of the track in use to reach the gap in the Owen Stanley Range, and as far as the gap we were on tracks of which little is known. Our march to Mount Oriori was chiefly through the Moroka district, the track at first passing through country consisting of blade grass and low scrub, and then of high scrub and successive ridges. We travelled slowly, stopping one whole day at a Moroka village on the way, and reaching Mount Oriori on October 31. The villages in this district consist of five or six houses on a cleared space on the sides of the hills, and were of the same type as those seen about Port Moresby—a hut on poles with a verandah in front, the hut being thatched with blade grass. Physically, the natives here are of a lighter build than those met with at a higher elevation. They have prominent abdomens, and many have enlarged spleens, due to the malaria, which is prevalent in this district. My shooting boys brought in good specimens of four species of birds of paradise—*Paradisea raggiana*, Port Moresby Rifle-bird, *Ptilorhis intercedens*, The Magnificent Bird of Paradise, *Diphyllodes magnifica*, and King Bird of Paradise, *Cicinnurus regius*.

The birds of paradise are tracked by their cry, the native following up the call till he is right under a bird. They are not often seen flying about, with the exception of the *raggiana*, which is frequently seen in the high trees in this district, and whose loud

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*This article is abridged from a paper read before the F.N.C. on November 18, 1906, and published in the *Victorian Naturalist* for January, 1907. It is reprinted here because of the keen interest now being taken in the Owen Stanley Range.—Editor.

cry dominates the forest. Besides the birds of paradise we got three species of pigeons—a large blue pigeon, *Carpophaga rubiensis*, and a large and small bronze-wing pigeon.

We arrived at the cave in Mt. Oriori October 31, but only remained one night, and did not go to the top of the mountain, as we were anxious to push on while the weather was fine, and intended making a longer stay in this neighbourhood on our return. Leaving the cave, we proceeded up the Anoki Moia ridge, and camped on this ridge after walking 2½ hours in a westerly direction. We remained here till November 3, I think at an elevation of about 4,500 feet. Between this ridge and Mount Oriori was a rich valley with lofty trees, and quantities of wild fruit lying about on the ground. In this neighbourhood, in addition to the four species of birds of paradise already mentioned, we got five new ones—D'Alberti's Bird of Paradise, *Drepanornis albertisi*, the Superb Bird of Paradise, *Lophorina superba*, Southern Six-plumed Bird of Paradise, *Parotia lawesi*, the rare and beautiful Prince Rudolph's Bird of Paradise, *Paradisornis rudolphi*, and the large longtail, *Epimachus meyeri*. The cry of the Southern Six-plumed or Sixpenny Bird of Paradise is almost exactly imitated by the native, so it is easily secured, the bird answering the call of the hunter.

Farther up the ridge I had pointed out to me the dancing ground of the Southern Six-plumed Bird of Paradise. It consisted of a space on the ridge cleared of moss and dead leaves, across which were three thin branches within a foot of the ground and bare of leaves. The birds hop to and fro from the branches to the ground whilst displaying their plumes. We found three bower-birds' play-grounds within a quarter of a mile of camp, of which I was able to get good photographs. The play-ground consists of a dome-shaped mass of twigs, with two rounded openings which communicate within. The space between the two openings is occupied by a flower garden, the bed of which is formed of the fibre taken from the stems of the tree ferns. Into this bed the bird sticks flowers, berries, bright-coloured leaves, and beetles' wings, renewing the flowers as they fade. In front of the two openings is a yard enclosed with twigs and strewn with large scarlet fruit. This type of play-ground seems to be confined to an elevation of 3,000 to 6,000 feet, and is usually situated on a slope just below a ridge. Above this elevation the play-ground is differently constructed. In these play-grounds I have never seen the feathers, shells, and pebbles common in the play-grounds of some of the Australian bower-birds.

On November 3 we proceeded up the Anoki Moia ridge till we got to the summit, and then down the other side to Oregenumu village, in the Eafa district. The valley above which the village is situated is watered by a tributary of the Brown River. In this day's march we went about fifteen miles in a N.N.E. direction, the summit of the ridge being, I think, about 6,000 feet above sea-level. We were walking most of the time on roots and mosses some distance above the actual ground.

The Eafa tribesmen, who met us half-way to take us to their village, are a very sturdy lot, being short, but with big bones and muscles and strong features, and there is great breadth between the eyes, contrasting with the more slender Moroka boys. These men wore the short kilt peculiar to the mountaineers, composed of plaited native string or of strips of bark taken from trees grown in their gardens, the kilt being about a foot long. Oregenumu village is prettily situated on a ridge, with handsome trees and tree-ferns resembling the Norfolk Island variety growing close by.

The arrangement of the dwellings in this village is peculiar. At one side of the clearing are the bachelors' quarters, consisting of two houses with a covered-in space in front. On the other side are quarters of the married people and children, consisting of a number of tiny huts, in a row, completely separated except for a common roof which spans the spaces between the huts and extends for about sixty yards. I believe this type of building is uncommon in New Guinea. The gardens here are very large, and contain quantities of taro, which appears to be much the most nutritious of the native foods. The natives say they can go all day on one meal of taro, but cannot do so on yams and other foods. Where taro is plentiful the natives generally have a fine physique.

On November 7 we started for Kage, crossing the river (a tributary of the Brown) and ascending the opposite range. Before reaching the top of the range we passed through some low scrub and bamboos, reported to be a good hunting ground for the *P. rudolphi*. On reaching the summit we travelled in a north-east direction along ridges through scrub country, keeping the valley we had crossed on our left, and reaching the chief Géve's house in the Kage district on the evening of November 7. The second day's march was very severe, being up and down a succession of very steep hills. The chief distributed food to my party. With natural courtesy he served first of all the Moroka boys, who came from a distance and were strangers to him; then the Eafa people, who were friendly neighbours; and last of all his own invited guests in the garden house. He presented his white visitors with a roasted cuscus or opossum, which I was hungry enough to enjoy. I saw no real villages in this district, but there seems to be a large population. There were wooded ridges everywhere, which were studded with cleared spaces where there were gardens and native huts.

Mr. L. W. [illegible] [illegible] 1940-41.

Mr. P. C. Morrison, President, 1941-43.

The next day, November 8, we rested in camp to arrange our trip over the Owen Stanley Range, the gap in the range being close by. We started the next day, November 9, with ten of our boys, three local carriers, and Géve's son, having with us a rifle, a shot gun, and revolver. We intended trying to reach Kokoda station in two days. On approaching the Iuroa River, which flows through this part of the range, we descended sharply through groves of bamboos, the cut ends of which, sticking up on the track, we had to be careful to avoid, as they cut like a knife. On crossing the river we climbed a mountain and then came on the river the other side. We were able to cross the greater part of the river here by rocks, there being little water. Where the water was deep and flowing swiftly there was a small bridge, about a foot wide, and composed of thin saplings loosely held together at the ends by loya cane. A false step on this bridge would probably mean a broken leg. As it was too late to get to Isurava village that night, we camped, and reached the village at 9 the next morning.

The natives here almost all blacken their faces, with the exception of a line down the centre of the face. Many wear their hair in little, short ringlets. The tail of the tree-climbing kangaroo is a favourite article of adornment. A piece of bamboo is placed in the hole in each ear, and through this the end of a tail is thrust, presenting the appearance of a whisker on each side of the face. We now found that Géve's son had never been further than Isurava, and did not know the way to Kokoda, but luckily an Isurava native with a huge cassowary plume head-dress and forbidding blackened face consented to act as guide. The first few miles from Isurava were terribly rough for rapid walking, the track being on the steep slope of a mountain. One was continually tripping or slipping over loose stones, slippery rocks, logs, creepers, and roots hidden on the track, and where the scrub was low one's hat or clothes were frequently caught in the tendrils of the wild raspberry. The streams were spanned with slippery logs, often some height above the water, which I had to cross with great care, though the natives got over quickly enough with their bare feet.

We had been travelling at a great rate in our desire to reach the station before nightfall, but without result, the flat being covered with lofty trees, which excluded all view of the country, and we were obliged to camp for the night. The boys were knocked up with sore feet from rocks and leech-bites, and disheartened at not reaching the station, all finding themselves in a country unknown to them. After some trouble we found the track the next morning, and reached the station at 11 a.m.

Kokuda station is situated about 1,000 feet above sea-level, on a slight elevation above the surrounding flat country, and has a very large garden, beautifully kept, and containing chiefly taro, We were very kindly received and assisted by the officers of the station. I wished I had taken my trade and stores through with me, so that I could have travelled about this country. There were more birds and butterflies than on the other side, and the Marquis Raggi's Bird of Paradise and the Goura Pigeon are slightly different. The country on the way to Kokoda was strewn with fruits of various shapes and sizes and of the most brilliant colours, very tempting to the eye, but all those I tasted had a disagreeable flavour, and many made the sputum froth.

We only remained at Kokoda one day, starting back on November 12, and reaching Kage by the same route on November 14, where we found the stores and trade safe. In our march over the main range, I think the highest point we reached was about 8,000 feet above the sea-level. The ridges at this elevation are still covered with trees, which are smaller, and there is not so much undergrowth.

When camping at this elevation and having our tea, there were two females of the small long-tailed Princess Stephanie's Bird of Paradise, *Astrapia stephaniæ*, feeding over our heads in a pandanus tree, and I have seen in this locality as many as six of these birds feeding in a single tree. They are easily seen, but make very little noise, not more than a twittering. The large longtail, *Epimachus meyeri*, met with at the same elevation, is not so common, but is easily tracked by its cry, which somewhat resembles the roll of a kettledrum.

I saw here a bower-bird's play-ground, which differs from the one already described. It has the shape of a saucer, about a yard in diameter, and composed of moss. In the centre of the saucer and round the stem of a bush is placed a bundle of twigs. I have seen three of this kind of play-ground, all being, I think, over 6,000 feet above sea-level.

Geve killed a pig the night after our return, and there was a feast, the Kage tribesmen, who have fine voices, singing far into the night—gardening songs, I think. Their voices are powerful, and messages are carried a long way very quickly by calling out from ridge to ridge. The distribution of hair on the bodies of some of these mountaineers is peculiar, there being little tufts of hair all over the back. I believe this distribution of hair is extremely rare amongst the races of man.

On November 20 we left for Oregenumu Village, returning by a different route to this village. Going in a southerly direction we reached Argulaugau, an Eafa village situated in a rich flat with hills all round. There is a palm tree here remarkable for its height, being nearly twice the height of the forest trees, which are large here.

We heard here for the first time of the massacre of Ekiri Village.

20 miles in land from Port Moresby, nineteen people being murdered. The massacre had taken place about two weeks previously, but had been concealed from us by the natives amongst whom we were.

On reaching Oregenumu Village we camped for three days on a ridge above the village, chiefly to see if we could get any more specimens of Prince Rudolph's Bird of Paradise, *Paradisornis rudolphi.* There was a lot of low, thick scrub on the ridge, and dense masses of bamboos, with larger trees on the slopes. On the last day I crawled into the thickest part of the scrub, and to my surprise the female of the rare Prince Rudolph's Bird of Paradise came flying round my head. We found the nest on a small tree hidden by the lower scrub. If the bird had not shown the way it would have been quite impossible to have found the nest. A native climbed the tree and brought down a young bird almost ready to leave the nest. We replaced the bird. The boy said the nest was composed of twigs. I believe this is the first time the nest has ever been found. The young bird almost exactly resembled the adult female.

During the wet weather, of which we had a good deal at this camp, the boys would employ themselves making arm bracelets from the fibre taken from the stems of ferns, which are very neatly plaited. The particular fern they were using grows to a height of 20 feet in the scrub. They usually put into the bracelet in addition a few strands taken from the stems of orchids, the orchid stem being first baked in a piece of bamboo till it turns the desired golden colour.

On reaching the neighbourhood of Mount Oriori we stopped for three days on a sugarloaf-shaped mountain in a cave formed by a huge overhanging rock and commanding a fine view of a gorge and of a mountain on the opposite side. The Moroka boys were very glad to be back in their own district, but were not so energetic as they had been, preferring to sit about and chew their beloved betel nut, which they had not been able to obtain in the Eafa and Kage districts, or to recount tales of their doings on the main range.

In this district we got five Tree-climbing Kangaroos, which were larger than those in the Melbourne Museum. To secure this animal a native climbs the tree and drives it out to a far-out branch, and as the native keeps approaching the animal drops to the ground, where it is clubbed. We got here wallabies, cuscuses, scrub turkeys, Manucodes, a Cat-bird, a hornbill, five different species of parrots, and a Cassowary's egg.

On leaving the cave we travelled to Barikoro, a small village six miles north-east of Sogeri Coffee Plantation. From this village there was an extensive view of a valley extending to the north-east, watered partly by the Laloki River and partly by the Kemp Welsh, beyond which were densely-wooded ridges as far as the main range. We remained here for one week, chiefly to get some more specimens of the commoner birds of paradise met with at a lower elevation, but all were out of plumage, so we gave up shooting them after the first three days.

We arrived safely at Port Moresby December 13, having been away in the bush for nearly seven weeks.

We had shot eleven species of birds of paradise, eleven species of pigeons, six parrots, and many other birds, among which the following have not already been mentioned: *Lorius erythrothorax, Charmosyna stellæ, Peltops blainvillei,* and *Henicophaps albifrons.* I collected thirty-one species of birds' eggs, and seventy species of butterflies and moths, most of which were large and bright-coloured.

As there appeared to be a difference of opinion amongst people I had spoken to in port as to the nature of the food of the birds of paradise, I opened the crops of each species we shot and examined the contents. The Raggianas had pulp of an orange-coloured fruit, called by the natives varvio, in their crops, sometimes other fruit, and occasionally a tree grasshopper. The crop of a King bird contained wild banana pulp and seeds; that of the Rifle-bird contained in one case very hard, large seeds, and in another soft fruit and a tree grasshopper. The other birds all had various kinds of fruit in their crops and sometimes a tree grasshopper, with the exception of a large longtail, *Epimachus meyeri,* whose crop contained what looked like moss. Another large longtail had berries in its crop almost exactly resembling the common English blackberry.

The Raggiana has a special tree where the males congregate to dance. The Six-plumed and Magnificent have dancing grounds, which I have already described. I believe the other species of birds of paradise in this district do not congregate in one tree, but dance and display their plumes in any tree.

Many of the rarer birds of paradise appear only to have one egg. Anthony once found in a pandanus tree the nest of the Twelve-wired bird, *Seleucides nigricans,* which contained only one egg. The nest of Prince Rudolph's Bird of Paradise, *Paradisornis rudolphi,* which we found contained only one young one. One of my boys, Marria, once found the nest of the Magnificent containing only one egg, which the bird hatched. I believe the Raggiana, which is very common, has three eggs. We were fortunate in having a drought while in the mountains, as these regions have a terrible reputation for rain.

POLLINATION OF *SALVIA REGELIANA*

By EDITH COLEMAN, Blackburn, Vic.

Whether grown for their bright colours, as bee or bird lures, for culinary use, or as neat border-plants, Salvias pay a handsome footing.

A happy garden friendship with *Salvia regeliana* made me wish to learn something of its history, for it is certainly one of the most interesting plants in an important family. It is not listed in any seed catalogue (English. American or Australian) known to me; nurserymen of whom I have made inquiries do not know it. Mr. Willis tells me that there is neither specimen nor description of it at the National Herbarium; but a reference in *Index Kewensis* places it as a native of the Caucasus, first described in 1866.

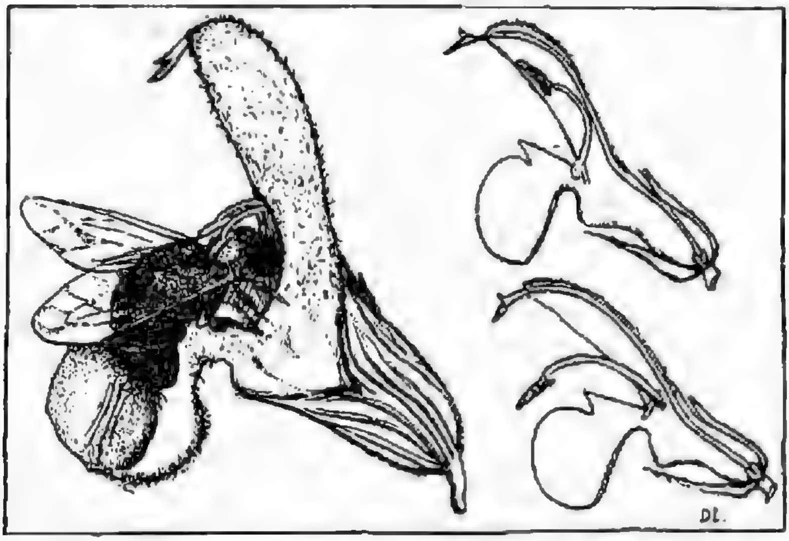
Yet it is a Salvia which merits a place in any garden, not only for its beauty, but for the ease with which its marvellous pollinary mechanism may be followed. Without the use of a lens one sees the movement and changed positions of stamens and stigma which effect cross-pollination.

My seeds of *S. regeliana* were sent to me from Chelsea Physic Garden, London, by the Director, Mr. G. Robinson (now of Oxford), who knew of my interest in pollination. Since watching the flowers for several seasons I have realized its usefulness to Chelsea Garden, which is no longer the "Apothecaries Garden," but, for the last forty years has functioned as a Botanic Garden attached to the Colleges, Polytechnics, and schools of London, supplying teaching and examination material. It is a Salvia with attractive amethyst flowers of about the same size as those of the well-known culinary Sage, but produced in greatly larger numbers, covering stems 2 feet in length—flowers that are very attractive to bees. Over a long flowering period they are visited for both nectar and pollen, from the opening of the first flower to the last.

One cannot fail to note that visiting bees have a patch of pale pollen on the thorax. As an insect enters a flower, with effortless ease in this Salvia, anthers are clearly seen to descend from the hood, sinking into the bee's hairy thorax. It is just as though two fingers of a hand reached down to hold her firmly while she drains the nectar that lured her into the flower. As she backs out, and the "fingers" rise, one notes that more pollen has been left on her already well-dusted thorax.

One may see her now enter an older flower in which the forked stigma has grown downward toward the throat of the flower. When she pushes into the opening the receptive inner surfaces of the stigma are brushed by the bee's pollen-dusty thorax and cannot fail to gather up the vital grains that are to ensure fertile seeds.

One sees the same thing happen in a hundred flowers—not one will she miss—and as a result of her good work every flower will set seed. There could be no finer plant for bee-pasturage. Not only are nectar and pollen produced in abundance, but, more important still, the stores may be harvested with a minimum of wasted time. Instead of flying from plant to plant in search of the colour she is exploiting the bee has only to work from flower to flower on the same stem. Usually nectar-gatherers do not collect pollen, but sometimes, as one may see, a bee combines both offices.



Salvia regeliana stamens striking bee's thorax. Right: Section of flower showing one stamen in "ready" position, and as moved by bee.

Many pollen-gatherers appear to enter the "taverns" for refreshment, and probably bear away full sacs of nectar for the hive. One may see them at white heat scratching away at the spent anthers until not a grain of pollen is left, pausing for a moment on a leaf to moisten and pack it into pollen-baskets, smoothing it into the rounded heaps which are such a familiar sight in flowery gardens.

No one can fail to remark the beauty of a contrivance which ensures that pollen may only be scraped from the anthers after the stamens are spent and no longer spring back into the hood. The pollen is so abundant that the bee does not always trouble to smooth her heaps, but carries them away "in the rough."

As one tries to follow the movements of her legs in removing pollen from her hairy coat one is ready to believe that they far surpass the human hand in the range and perfection of the work they perform. To watch it is "to live in the very spirit of wonder."

The bee is often so loaded, either with pollen or nectar, that she rolls over in attempting to "take off" for the hive. Seeing her eagerness and tireless expenditure of energy one feels no surprise that her life is so short.

Salvia regeliana is a perennial which may be increased by root division as well as from seed. The stems, as well as the petioles, midribs and veins of leaves are tinted grape-purple. A beautiful feature is the cone-shaped growth of the budding inflorescence, also purple tinged. It is certainly a charming plant to have in the garden, especially where there are children to learn something of the marriage of flowers.

In this garden it forms a background to a line of lavender, kept low by clipping, in front of which is a border of catnip. The three make delightful summer pictures.

As *Salvia regeliana* is not procurable through the ordinary sources our seeds have been donated to the Red Cross. They will be supplied at 1/- per packet, plus 1½d. postage.

PRESERVATION OF NATIONAL MONUMENTS

The current (August, 1942) issue of *Mankind*, the official journal of the Anthropological Societies of Australia, announces a commendable project for the preservation of a fine series of aboriginal rock-carvings in New South Wales. At a time when so much destruction goes on, this news will arouse a grateful interest. The plan, which deserves a wider publicity, follows a splendid gift of ten acres of ground on Mangrove Mountain, near Gosford, where the extensive group of carvings is situated. The owner of the land, Mr. Peter J. F. Howe, has generously agreed to revert it to the Crown, free of cost, so that the permanency of the native carvings can be assured. Steps are being taken to vest the land in the "Peter Howe Trust." The reserved area will also serve as a survey base for other rock-carvings in the locality to be adequately recorded and protected by members of the New South Wales Anthropological Society. Visitors will be permitted access to the site.

H.C.E.S.

PIPEFISHES—SYNGATHIDAE

Three pipefishes captured at Port Melbourne gave birth to families of 26, 16 and 24 respectively. Attached to the last-born, in each case, was a long, narrow, transparent envelope, divided in a double row of tiny compartments, in one of which a dead baby fish was neatly coiled. These sheaths were drawn around for about an hour before being detached.

M. E. Freame.

VICTORIAN LICHENS

By P. Bibby, National Herbarium, Melbourne

Our first record of lichens' being collected in Victoria occurs in 1854, when Dr. Ferd. Mueller made a collection from the vicinity of Sealer's Cove. These he sent to Dr. Hampe for naming. A list was subsequently published in *Linnaea*, as well as by Dr. Mueller in his report to the Victorian Council. Some 31 lichens were named, many of which are in the National Herbarium, Melbourne.

In 1880 a further list of 122 names was published by Dr. Krempelhuber in *Der Verhandlungen des Kais. Kaen. Zool. Bot. Gesellsch*, Wien. These, sent by Dr. Mueller, were composed of collections made by various Victorian botanists. The same lichens were later inspected by Prof. Jean Mueller (Mull-Arg), who changed many of the names. Professor Mueller made a thorough examination of lichens in practically every country throughout the world and his deliberations constitute a wealth of literature on the subject.

Others who have made collections of Victorian lichens are Mr. Hugh Paton, Mrs. Martin, F. M. Reader, C. French and Rev. F. R. M. Wilson; the last-named contributed more to Victorian lichenology than anyone else. His descriptions of new lichens appear in the *Proc. Royal Society of Victoria* and the *Victorian Naturalist*. R. A. Bastow also made an extensive collection, but his chief study was mosses. In *Vic. Nat.*, Vol. XXX (1914), Mr. Bastow published his "Notes on the Lichen-flora of Victoria," which seems to be the last work attempted in this State.

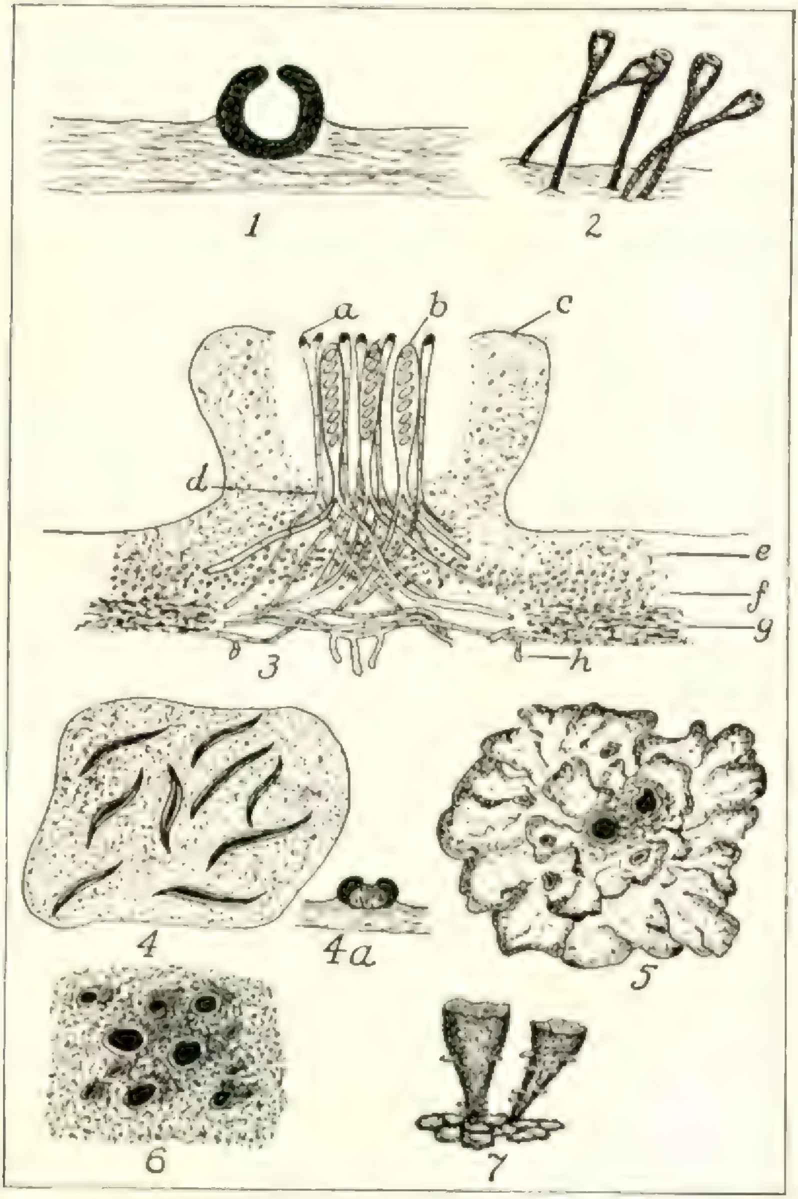
General Morphology.—Lichens have a very remarkable structure as, unlike most other plants, they have neither roots, stem nor leaves, although some of the Parmelias and Cladonias have leaf-like thalli. They are the union of two distinct and dissimilar organisms—fungal hyphae, which are usually a species of *Ascomycete*, and an alga, which may belong to *Myxophyceae* (blue-green algae) or *Chlorophyceae* (bright green or yellow-green algae). Each of these, the algae and the fungal hyphae, work for the benefit of the other, commonly known as symbiosis.

If we cut a section of the thallus, the vegetative part of higher lichens, we shall see it is composed of an outer layer or upper cortex, an algal layer of green algae gonidia, the medulla consisting of hyphal threads, and the lower cortex, from which grow hair-like structures, the means of attachment; these are called rhizinae.

There are two types of fruiting bodies:

(a) Perithecia in *Pyrenocarpae*.
(b) Apothecia in *Gymnocarpae*.

The perithecium is a small globose body immersed in the thallus, opening at the top by a pore. It is composed of an outer wall,



For Key, see page 110.

enclosing the hymenial tissue, asci and spores; the paraphyses or long sterile cells are very sparingly produced in a perithecia.

The apothecia is an open concave or convex disc, made up as follows: the thalline margin or amphithecium, which may be the same colour as the disc (lecideine), or the same colour as the thallus (lecanorine). Inside this, at the base of the apothecia, is the hypothecium, which may be hyaline or brownish; and situated on this is the hymenium, consisting of the asci with their spores, and the sterile paraphyses which act as a protection to the asci.

The spores, usually eight in number, are produced in the ascus by the fungal organism of the lichen, and on liberation can only produce a new lichen thallus by coming in contact with the particular species of alga which was in the parent lichen. Spores are the means of identification of all lichen genera; some are brown, some hyaline and with various septation.

Lichens may also be produced by soredia, which are masses of hyphae and algae occurring in foliose and fruticose lichens. Soredia, when carried by the wind or other means, find a favourable environment and commence to grow into a new lichen thallus. Fragmentation is another means of reproduction—a piece of the thallus breaks away and on finding suitable conditions also produces a lichen thallus.

The uses of lichens are various. Some are used for dyes. *Cladonia rangiferina* is eaten by the reindeer, hence the name "reindeer moss." Some were used for medicine in the fifteenth century. Several lichens are used for food; Sturtevant, in *Edible Plants*, mentions *Lecanora affinis* and *L. esculenta*. Errera regards the latter as the manna mentioned in the Bible. *Cetraria islandica* is used by the people of Iceland and Norway; and *Gyrophora muhlenbergia* is regarded as agreeable and nutritious by the natives of the Arctic countries. However, it would seem they are used only when other foods are scarce.

FIGURES TO ILLUSTRATIONS

(All Figures greatly enlarged)

1. A perithecium. 2. Mazaedia, the type of fruiting bodies in *Calicium*.
3. Section through apothecium, central parts enlarged. 3a. Paraphyses.
3b. Asci containing spores. 3c. Thalline margin. 3d. Hypothecium.
3e. Upper cortex. 3f. Gonidial layer. 3g. Lower cortex.
3h. Rhizinae. 4. Lirellae fruiting bodies in *Graphis*.
4a. Section through a lirella. 5. Thallus and apothecia of *Parmelia*.
6. Thallus and apothecia of *Lecanora*.
7. Podetia and squamules of *Cladonia*.

NOTE ON SEED GERMINATION

In October, 1938, fruits of *Cyathodes acerosa* (Crimson Berry, fam. Epacridaceae) were obtained at the Field Naturalists' Wildflower Show, and were planted the following month. They germinated in the spring months of 1941, taking three years to germinate.

R. G. PAINTER.

THE SHORE SPLEENWORTS OF VICTORIA

By N. A. WAKEFIELD, Genoa, Victoria

Among our most unusual ferns are the two Shore Spleenworts which are found on rocky coasts, and are never away from the influence of salt spray.

The Shore Spleenwort (*Asplenium scleroprium*) has large whitish-green fronds 2 feet or more long, with large pinnae about 3 inches long, pointed and deeply toothed with the sori lateral on the edges of the teeth. The Small Shore Spleenwort (*A. obtusatum*) is dark-green and comparatively small, often very tiny, with short, blunt, obtusely toothed lobes on which the sori are by no means marginal. Younger fronds of *A. scleroprium* show an approach to the state of *A. obtusatum*; and, conversely, some large fronds of the latter are often somewhat toothed as in the former, so that the forms are both variable and seem to be connected by intermediates. This would normally indicate that we have but two varieties of the one species; but such an arrangement is not possible for reasons which can be gleaned from Cheeseman's discussion of certain forms of *Asplenium* in New Zealand:

> "The New Zealand species present exceptional difficulties to the student, on account of their extreme variability and the manner in which several of them are connected by intermediate forms. Thus *A. obtusatum* and *A. lucidum* not only run into one another, but are connected by transitional varieties with *A. bulbiferum* and *A. flaccidum*. *A. Richardii* almost merges with *A. flaccidum* on the one side and *A. Hookerianum* on the other, while *A. bulbiferum* and *A. flaccidum*, distinct enough in their ordinary states, are almost united by some of their aberrant varieties. With such a complex network of variation it is not surprising that the species are difficult of delimitation and their characters arbitrary" (*Man. N.Z. Fl.*)

Hooker considered *A. scleroprium* (*aucklandicum*) as a variety of *A. flaccidum*; Moore placed it as a variety of *A. lucidum*; and Christensen put it as a variety of *A. obtusatum*, as it appears to be in Victoria and Tasmania. If any one of these combinations is to be accepted, then by similar reasoning all of the species already mentioned (and several others) must be combined under the one specific name. This combination did in fact constitute Mueller's *A. marinum*; but that arrangement was not approved of by any subsequent botanist or fern-lover.

A paragraph from Dobbie's *New Zealand Ferns* could well be quoted here:

> "Some argue that if two species are connected by a series of intermediates they should be classed as one and the same species. That is to say, they should be differently treated from two other species where the intermediates have disappeared. This seems to be harking back to the original creation theory. What we require is a convenient division of the genus into certain easily recognized groups."

So the best course is to deal with *A. scleroprium* as Cheeseman did when he wrote: "Its unusual appearance is so distinct . . . that I now consider the better course is to treat it as a separate species." Thus, just as the Bass Strait Island fishermen recognize two Shore Spleenworts, so must Victorian and Tasmanian botanists do so.

Both species were originally described from New Zealand; but when *A. scleroprium* was found at Wilson's Promontory in 1885, Mueller listed it as *A. marinum*; and Bentham did not mention the former name in his *Flora Australiensis*. So in 1923-28, the F.N.C.V. Census of Victorian Plants incorrectly listed the mainland plant as *A. obtusatum*. In 1930, however, Ewart indicated this error by referring it to *A. scleroprium*, and in 1931 the F.N.C.V. Plant Names Committee fell into line with this correction. In 1934, in the F.N.C.V. book on Victorian Ferns, we have the first inkling of an addition to our fern flora, for a second form is mentioned as found at Snake Island, though it was simply put down as a variation of *A. scleroprium*. Ewart, in 1936, was the first to recognize the island form as *A. obtusatum*, which he added to his *Flora of Victoria*.

A. scleroprium, Homb. et Jacq., is found "in sheltered rocky crannies near Biddy's Camp, Wilson's Promontory (1927, A.J.E.)"; and in New Zealand it is "abundant on the margins of woods near the sea." It is recorded also from Bass Strait Islands, and some Tasmanian specimens seem referable to it.

A. obtusatum, Forst., was first reported for Victoria from islands of Bass Strait, near Wilson's Promontory, and was next discovered during the McCoy Society's visit of 1935-6 to Lady Julia Percy Island near Portland. An additional record—the first for the Victorian mainland—was made in January, 1942, when the writer found a patch of some scores of rather small plants on cliffs overlooking the sea along the coast a few miles south of Mallacoota Inlet. Otherwise the species is known from New South Wales, Tasmania and New Zealand, where it is abundant though always maritime.

The two forms are excellently described and illustrated by Dobbie as *A. obtusatum* (p. 232-3), and as *A. lucidum* var. *scleroprium* (p. 220-1).

PALOLO WORMS

Last December, at Altona, on an incoming tide the rock-pools were swarming with millions of small, greenish-brown worms about an inch long. The surrounding water was discoloured with eggs. Some specimens, on being taken home, were merely shrivelled skins, not worth preserving. I can only compare the worms—on a smaller scale—with the visitation of the *Palolo* worms of the South Seas, which are eagerly awaited each October and November by the natives, who consider them a great delicacy.

M. E. FREAME.

The Victorian Naturalist

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PROCEEDINGS

The ordinary meeting of the Club was held on October 12, 1942. The President (Mr. P. Crosbie Morrison) presided and about 80 members and friends attended.

ANNOUNCEMENTS

The President announced the death through an aeroplane accident of Mr. Chas. Fletcher, a country member, who was on active service with the fighting forces. Members stood in silence as a token of respect.

The recent marriage of Miss Dorothy Sarovich, a well-known member, to Mr. Frank Sides, the interstate cricketer, at present on Commando duties, was announced by the President, and good wishes from her fellow-members were expressed for their future.

NATURAL HISTORY OF MELBOURNE

The subject for the evening took the form of a symposium on "Outstanding Natural History Features in the Suburban Area," and was divided into three sections, Geology, Botany and Zoology.

Mr. A. C. Frostick led the discussions with a review of the general geology and physiography of the area. Mr. S. R. Mitchell, dealing with the minerals of the Melbourne district, mentioned in particular the famous zeolites of the Clifton Hill quarries. Mr. F. S. Colliver discussed the fossil deposits, mentioning the silurian series and the tertiary red sands, and stated that two specimens of outstanding interest, a fossil jellyfish and a crinoid, were recorded from the silurian beds of Brunswick.

Mr. Ivo Hammett led the botanical discussion and dealt with a remnant of Mallee flora to be found on the Saltwater River between Keilor and Sunshine. Mr. J. H. Willis mentioned the principal plant communities and dealt in particular with a salt marsh area near Williamstown. Mr. H. C. E. Stewart spoke on the Sandringham flora and the coastal tea-tree, and in passing mentioned the small plantation recently planted in front of the Public Library.

Mr. Morrison spoke in the zoological section on a living fossil type of crustacean recorded from Koonunga Creek. This animal has apparently been destroyed now as its old haunts have been made a concrete drain.

Several members took part in the various discussions.

FOXES AT SHERBROOKE

The Bird Observers' Club wrote seeking assistance in clearing foxes from Sherbrooke Forest. Members interested are invited to write to Miss Fletcher, Hon. Sec., at Chalmers Hall, Parliament Place.

REPORTS OF EXCURSIONS

Excursions were reported on as follows: Balwyn Sanctuary, Mr. Morrison, for Mr. Chalk; Frankston, Mr. C. French.

ELECTION OF MEMBERS

Mr. R. M. McKellar was elected to ordinary membership and Master Ian McKellar to associate membership.

EXHIBITS

Mrs. C. French—Bouquet of native flowers garden-grown (12 sp.).

Mr. C. French—Large flowering specimen of the Snake Orchid (*Diuris pedunculata*), also small flowering specimen of the same species. Collected by Mr. Fairhead at Frankston.

Mr. J. H. Willis—Ariel roots of the White Mangrove (*Avicennia marina*), Kororoit Creek; also two East Gippsland plants, *Poranthera corymbosa* and *Pomax umbellata*, found for the first time west of Melbourne, by the exhibitor, in the Brisbane Ranges, 11/10/42.

Mr. S. R. Mitchell—Minerals from the Melbourne suburban area.

Mr. A. A. Baker—Minerals from the Melbourne suburban area.

Master Leslie Woolcock—Venus flower-basket (*Euplectella*), a glass sponge from Japanese waters.

HOME THOUGHTS FROM ABROAD

Sir Edmund Teale writes from London under date July 12, 1942:

I desire to express my very sincere appreciation to the committee and members of the Field Naturalists' Club of Victoria for the honour they have conferred on me in my election to honorary membership of the Club. It is now more than 34 years since I left Victoria to take up service in tropical Africa. My close personal association with the Club was then broken, but my interest in its activities and the very pleasant memories of excursions and meetings continued. These were revived at intervals by an occasional visit to Victoria, and the friendly welcome by many of the members on these occasions was always much appreciated. The Club has most certainly rendered a very valuable service to the community in fostering a true love of nature and in its constant endeavour to keep before the public the need for vigilance in the preservation of many unique and beautiful forms of animal and plant life which are indigenous to the country. May these activities continue to extend their valuable influence and bring joy and pleasure to many in the future as they have done to so many, including myself, in the past.

NATURAL HISTORY OF MELBOURNE

A symposium on outstanding Natural History features of the Melbourne district was held at the October meeting of the F.N.C. Here follow summaries of the geological contributions to the discussions:

THE GENERAL GEOLOGY

By A. C. Frostick

The particular phase of general geology near Melbourne of most interest to naturalists is probably the effect of rock formations upon the type and distribution of vegetation. Within the area enclosed by a circle of thirty miles' radius from Melbourne, three such formations show a marked effect in this regard. To the west of the city the Newer Basaltic lavas of the Keilor plain are typified by grass lands; the bedded Silurian rocks occupying most of the area east of a line from Melbourne to Whittlesea are characterized by forest, scrub and pasture, while the Red Sands of the Sandringham area to the south-east provide the dwarf scrub so well known to Melbourne botanists. Of the three series, the Silurian sediments and the Basaltic lavas are of most importance geologically, and both extend far beyond the arbitrary boundaries set down above.

The lava flows of the Newer Volcanic period, for instance, cover an area estimated at nine to ten thousand square miles, mainly west of the meridian of Melbourne, but not exclusively so. They have been extruded at numerous widely-distributed points, over a period ranging from Pliocene to Recent times, and show some petrological variation. Some flows have been confined within the slopes of old river valleys, but the existence of extensive lava plains indicates that copious, or repeated, extrusion has also resulted in the complete submergence of former hill and valley.

The Silurian sediments are considerably older than the previously mentioned lavas, being, in fact, the oldest rocks outcropping in the Melbourne area, and consequently referred to as forming the "bedrock" of Melbourne. They consist of bedded sandstones, mudstones and shales, shown to be of marine origin by their fossil contents, and were laid down during the Melbournian stage of the Silurian system. As may be noted in the numerous quarries and road cuttings exposing these rocks near Melbourne, the once horizontal bedding planes have been inclined by earth pressure, and in some cases even thrown into a series of folds. An excellent example of such folding, together with faulting, may be examined in the crush zone exposed in the section along the road to Dight's Falls, at Studley Park. Neighbouring sections also show that these ancient sediments have been subsequently intruded by younger igneous rocks in the form of dykes or sills.

Like the Silurian rocks, the Red Sands are sediments, but otherwise have few characters in common with them. They consist in the main of sands, sometimes grits and gravels, cemented by a mixture of clay and red-brown iron oxide, though near the surface this cementing material is almost invariably leached out. Near the coast these rocks contain marine fossils, but farther inland the absence of fossils other than freshwater sponge spicules and the increased proportion of gravels indicates that they were in part spread over a land surface provided by the very much older Silurian rocks planed down during the long period of erosion preceding the deposition of the Red Sands. Along the then established river valleys the Red Sands have been in turn stripped by erosion to expose the underlying Silurian rocks, their northerly extension being now largely indicated by isolated hill caps, though, along the coast, their continuity remains unbroken.

In the case of the valleys formed by the ancestral Darebin and Merri Creeks, two streams in part responsible for the removal of portion of the Red Sands, invasion has taken place by Newer Basaltic lavas issuing from vents in the neighbourhood of Beveridge. So that the new valley cut by the Merri Creek shows, near Clifton Hill, the lavas resting upon dipping Silurian beds instead of on the Red Sands which should normally occur between.

Though other rocks of geological importance occur close to Melbourne, notably the Older Basaltic lavas, Cainozoic sediments, and the younger sediments of the Yarra Delta, their restricted area mitigates against their inclusion in these brief and rambling notes, which in any case are merely intended to outline the main features of the three series of botanical significance.

OUTSTANDING FOSSIL DEPOSITS

By F. S. Colliver

Within the suburban area the two outstanding deposits for fossils are, first, the Bed Rocks, consisting of Silurian sandstones, slates, shales and mudstones which outcrop in practically all districts. Two outstanding places are Studley Park, Abbotsford, and Moonee Ponds Creek, Flemington. Collecting at these two places, representatives of all the invertebrate animal Orders may be obtained and a good series rewards the time expended.

The most outstanding specimens obtained from the bed rock within the suburban area came from Brunswick; they consist of a wonderfully preserved example of a Stalked Star-Fish or Crinoid (*Helicocrinus plumosus*), with the stem terminating in a helical spiral process for attachment purposes and the feathery arms perfectly defined. The other specimen was a fossil Jellyfish (*Discophyllum mirabile*), so well preserved that even the thread-like processes around the mantle are to be seen. These two specimens are among the treasures of our National Museum and were described by our well-known member, Mr. F. Chapman, A.L.S.

The second deposit to be mentioned is the Tertiary Red Beds, consisting of iron-stained sandstones and sands. At the famous Royal Park cutting, representatives of all the invertebrate groups, fish and cetacea in the vertebrates as well as plant remains have been recorded. At Beaumaris a somewhat younger series contains numerous fossil sea-urchins and sharks' teeth, whilst at Pascoe Vale plant remains are in the finer sands.

MINERALS OF THE SUBURBAN AREA

By S. R. Mitchell

The mineral species occurring in the suburban area are comparatively few, due to the nature of the rocks prevailing, which with the exception of Silurian mudstones and sandstones comprise surface deposits and lavas of late geological age.

Three members of the Zeolite group occur abundantly in the olivene basalts common in this area. These are—

Phacolite: A hydrous silicate of alumina, lime and potash which crystallizes in the hexagonal system. It is found in the cavities as colourless or cloudy twin crystals of mostly hexagonal form, being a combination of positive and negative rhombohedra often modified to be lenticular in shape, whence the name from "phacos," meaning a "bean." Complex twins and groups occur often with one or more associated species.

Phillipsite: A hydrous silicate of alumina, lime and potash crystallizing in the monoclinic system is found as clear, colourless, or cloudy penetration twins simulating rhombic or tetragonal forms; nearly square prisms terminated with what appear to be pyramidal faces. These usually occur crossed or in complex clusters.

Mesolite. A hydrous silicate of alumina, lime and soda, crystallizing in the monoclinic system, occurs invariably as small white groups or tufts with a radiating fibrous structure and silky lustre, like grains of sago scattered over the surface of the cavities.

These zeolites have formed in the steam cavities and vughs of the basalt, crystallizing from heated solutions which have dissolved some of the more soluble constituents of the basalt. It is remarkable that two or more distinct mineral species, with their characteristic crystal form and structure, definite chemical composition, and physical properties could separate out from one solution. On the floor of many of the larger vughs is a clay-like substance, probably *Halloysite* which represents the excess hydrous silicate of alumina after the crystallizing of the zeolites.

These zeolites are only found in the deeper portion of the lava flows which infilled the ancient river courses, where the cooling was slower and more prolonged. Prior to this volcanic activity, two tributaries coming in from a northerly direction junctioned with the old Yarra somewhere in the vicinity of Clifton Hill, one following much the same course as the present Merri Creek, and the other trending south and somewhat west of the present Darebin Creek. The course of the former Yarra was revealed by a number of deep quarries (now filled in) from which stone was procured for road-making. It followed a southerly direction from Clifton Hill through Collingwood and Burnley (close to the present station); thence the direction changed west and the stream entered the sea in the vicinity of Princes Bridge. The lava overflowing this river valley gave rise to the flats that can be followed from Burnley to beyond Coburg and north beyond Fairfield.

In the large quarry at Clifton Hill, worked by the Melbourne City Council for over seventy years, well over 100 feet of basalt was exposed overlying river silt with occasional logs and tree roots. From this quarry a remarkable number of beautiful specimens have been collected. Formerly a quarry at Burnley and Chamber's Quarry at Richmond also yielded fine specimens. *Herschelite* was described by Ulrich from the latter, but was later determined as Phacolite. Another mineral plentiful in the basalt is *Aragonite*, a carbonate of lime crystallizing in the rhombic system. This also has formed from hot solutions and occurs as acicular crystals usually radiating from a centre, resulting in globular, botryoidal or mammalated forms. Occasionally individual crystals or groups, transparent, cloudy or deep brown in colour, are found also associated at times with Phacolite, Phillipsite and Mesolite.

Calcite.—The common variety of calcium carbonate occurs as incrustations in the cavities or as concretionary masses often distinctly banded, in botryoidal, reniform, mammilated or spherical forms with smooth surfaces, varying in colour from white to brown. This mineral has formed from cold solutions and is common in almost all the quarries.

Magnesite.—A carbonate of magnesia is found in white or yellow masses or aggregations of small grains in the surface soil or clay that results from the decomposition of the basalt.

Vivianite.—A phosphate of iron is occasionally found as a blue film lining some of the smaller cavities.

A few other minerals of no great beauty are to be found in the suburban area.

Gypsum in small brownish groups occurs in the material excavated in the Yarra delta at West Melbourne, usually in the interior of the partly decomposed valves of the marine bivalve "Arca trapezia."

Stibnite, a sulphide of antimony, was plentiful at the Ringwood antimony mine, and occasional specimens are to be found in the spoil heap, often coated by the yellow oxide of antimony, *Cervantite*.

Psilomelane.—Hydrated oxide of manganese is often found as dendritic markings on the bedding or joint planes of silurian mudstones and sandstones.

Silicified Wood, with doubly terminated quartz crystals of a brown colour, from the brown coal beds of the Altona Bay Mine, has been found on the spoil heap.

Limonite, the brown hydrated oxide of iron, and *Hematite*, the red oxide of iron, are found usually as a colouring medium in some of the sedimentary rocks of this area, particularly at the Royal Park cutting.

Biotite.—This silicate of magnesium, aluminium, potash and iron occurs as six-sided black plates in a decomposed dyke just below the Melbourne High School building at South Yarra.

Kaolin.—This more or less impure silicate of aluminium is found at Greenvale, underlying tertiary sands, and at Bulla, either as a pneumatolytic alteration of a granite or an altered felspathic rock.

THE NEW TREE-FERN

Mr. W. Hunter writes from Bairnsdale to Mr. N. Lothian:

I do not know whether I gave a wrong impression of my ideas in my recent letter about the new tree-fern, *Cyathea marcescens*, or whether the reference to it in the Club journal is not quite accurate; but what I intended to say was that if any member of the Club wished to try raising plants of this tree-fern, I would do my best to obtain spores next time I am in those parts. I have never intended to try growing the plants myself. My wandering life puts any such idea out of the question. Also, the Mount Drummer area is not, strictly speaking, a forest reserve, in the sense of a State forest or timber reserve under the control of the Forests Commission. It is reserved as a park (officially known as Alfred Park) for the preservation of natural features, the flora of course being the feature chiefly in view. So, in theory at least, the Government has already fully protected that area.

I have already given you my opinion that, for some generations at any rate, the only menace to be feared is an exceptionally severe bush-fire. A letter which I received a few days ago from Norman Wakefield (now on military service) shows that he has more reassuring views on that point. This is what he has written to me about it: "You can assure your correspondents that the new *Cyathea* is safe from extermination. At Mount Drummer the majority of the specimens are far from the road (heads of Karlo Creek, etc.), and at Combienbar they are three or four miles from the nearest selected properties. Both areas have been severely burned several times, and each time the patches of 'jungle' along the creeks have escaped and the ferns survived. So they are safe from fire and settlement."

Jean and "Jeremiah" as a "Joey"

Photos by [illegible]

"Peter" (adult [illegible]) Phalanger

"JIM" AND "TIP," THE FLYING PHALANGERS

By B. E. Carthew, Portland, Victoria.

Four and a half years ago a bush fire swept through the forest at Heywood, situated in the south-western portion of Victoria. Considerable damage was caused, not only to the forest, but to the fauna as well.

It happened that whilst Mr. H. Aldridge, of Heywood, an official in the Forestry Department, was walking through the forest after this fire he came upon one of our prettiest little mammals of the bush, the Pigmy Phalanger, or, as the bush folk still commonly call it, the Flying Squirrel. The little animal apparently was completely lost. It had volplaned to earth, and as the only way these creatures can "fly" is by reascending another tree, and as all of those nearby were still on fire or burnt down, it was easily caught by Mr. Aldridge. He took it home and gave it to his daughter, Josie, who although delighted with her quaint little pet-to-be was nevertheless somewhat mystified as to what to feed it on. No text-book was available.

"Jim," as he was named, was placed in a box, where he remained cuddled up by day, but at night he became very lively. Bread and jam, milk and honey appeared to fit the bill excellently; then one day a startling discovery was made. "Jim" was perched on Josie's shoulder near the window when suddenly he volplaned on to the curtain and commenced tackling the blowflies, and in an incredibly short space of time had cleaned them all up.

About twelve months ago another Phalanger was found and Josie took it to provide company for "Jim" and named it "Tip," on account of a white tip to its tail. The two animals lived happily until one night a big moth came into the room and settled down near them. Instantly there was a commotion and in the scrimmage the moth was torn to pieces. Josie had discovered something—they must like grubs, why not try them? Next day her father brought home a few of the big white grubs found in forest timber and similar to those used by fishermen on the Murray River. These were devoured by the Phalangers with evident delight. No matter what else is on the menu, these grubs are now given first preference. (Thus we know why they pull the bark off trees and why they have such sharp teeth.)

"Jim" and "Tip" are very fond of the wireless; they will sit and listen for as long as an hour at a time alongside the set. In summer-time they both have their bath in a special tin, after which they are taken out and dried. I personally lost one in a bucket of water, during a drought, but until Josie gave the information to me I did not know they could swim. Still when you look at the web-like construction of their whole body this is not surprising.

These little pets have become well known in the township of Heywood, for Josie often takes them out for a stroll perched on her shoulder or in their box. Car riding upsets them and they become very nervous for a day or so afterwards. They rarely attempt to bite—kindness overcomes most things. It is safe to say this is a record for a Phalanger to have been kept in captivity—four and a half years.

Note.—Since the above was written "Jim" has given birth to twins—and thus has been re-christened "Jermyn"! "Tip," the male parent, assists to cuddle the babes, but he is not nearly so domesticated as "Jermyn."

THE CORRECT NAME OF OUR ALPINE PODOLEPIS

By JAMES H. WILLIS, National Herbarium, Melbourne

One of the showiest flowers on Buffalo, and around peat bogs at other high levels, is the Long Podolepis, which is, as Ewart remarks (*Flora of Victoria*, 1930), "confined to alpine regions of the north-east." This seems incongruous, in view of the type location of *P. longipedata* at Moreton Bay and the coastal distribution of most N.S.W. and Q'land material preserved in the Melbourne Herbarium. Maiden and Betche (*Proc. Linn. Soc. N.S.W.*, Vol. 23, 1898, p. 12) had described a plant from the Kosciusko-Kiandra mountain chain, N.S.W., under the name *Podolepis longipedata*, A. Cunn., var. *robusta*. Their type is identical with Victorian collections from Buffalo, Hotham, Cobboras and Mt. Wellington, but is this stout, woolly, large-headed mountain Podolepis referable to *longipedata* at all?

Bentham distinguishes *longipedata* from *acuminata* in its having the laminae of the intermediate involucral bracts *much shorter than their claws*; the innermost bracts would naturally have still shorter laminae. Now Maiden and Betche describe the inner laminae of their new variety as "only slightly *longer* than the claws"—a feature which should at once exclude var. *robusta* from the specific concept of *Podolepis longipedata*. Moreover, Bentham appreciated the affinities of the Cobboras and Mt. Wellington district specimens with *P. acuminata* and unhesitatingly cited them under that species. I believe the alpine form to be worthy of varietal rank, but since it appears to have little in common with typical, coastal *P. longipedata*, and much in common with *P. acuminata* (claws concealed by the long laminae, as in Robert Brown's type specimen), I transfer it to the latter species, and suggest the vernacular of "Alpine Podolepis," so—*PODOLEPIS ACUMINATA*, R.Br., var. *ROBUSTA* (Maiden et Betche), *comb. nov.*

Other Gippsland collections of ostensible "*P. longipedata*" from lower altitudes (Delatite and Macallister Rivers, etc.) are characterized by dense clusters of short-stalked heads, with the laminae of median bracts sometimes equal to the claws—in this they also approach as closely to the type of *acuminata* as to its congener, and may indeed represent a condition intermediate between the two. To my knowledge, typical *Podolepis longipedata*, with elongated peduncles and long exposed claws to the bracts, has not as yet been collected in this State.

THE SECTION *GENOPLESIUM* IN THE GENUS *PRASOPHYLLUM* (ORCHIDACEAE).

Descriptions of seven new Species, with Observations on the Section, and Notes and New Records of established Species.

By the Rev. H. M. R. Rupp, Northbridge, N.S.W.

Part I.—New Species.

Some introductory remarks will doubtless be expected in order to explain how it comes about that so many new species, all but one of them from the central-coastal and Blue Mountains areas of New South Wales, are here presented simultaneously. The exception is a Western Australian plant—the first *Prasophyllum* of the section *Genoplesium* to be discovered in that State. The remaining six really owe their appearance in public to the researches and industry of Mr. Erwin Nubling, of Normanhurst, near Sydney.

Some years ago, at the instance of the present writer, Mr. Nubling sent to the late Dr. R. S. Rogers, of Adelaide, a large assortment of specimens, accompanied by very numerous careful drawings and notes, of these small orchids which he and his wife had discovered in the N.S.W. areas mentioned above. Dr. Rogers told me in a letter that there were perhaps a dozen undescribed species among these plants, and added that he hoped to be able to publish them all. Pressure of other work, and later the increasing infirmities of age, prevented the accomplishment of the Doctor's purpose.

In May this year (1942) the writer approached Mr. Nubling with a view of ascertaining, if possible, whether certain forms he was then investigating were identical with any of those sent to Adelaide. It transpired that the originals of all the drawings and notes sent to Dr. Rogers were still available, and that in most cases specimens in formalin had also been preserved. Mr. Nubling then put the whole of his material at my disposal, suggesting that I should prepare for publication descriptions of such forms as seemed to me to merit specific rank, and also notes on other forms which I considered should be given publicity.

It will be clear, then, that to Mr. Nubling is due the credit for the discovery (and indeed for the description also) of nearly all the new forms dealt with below. The wealth of illustration with which his notes are embellished has greatly lessened the difficulties of my own task. I may add that he has paid special attention to a point discussed in Part II of this paper—the possibilities of altered appearance in floral details at different stages—so that the risk of unnecessary "hair-splitting" has, in my opinion, been entirely avoided.

1. *PRASOPHYLLUM HORBURYANUM*, *sp. nov.—Planta gracillima, in speciminibus meis circiter 13 cm. alta. Bracteae lamina brevis, prope spicam. Flores parvissimi, 12-15, fusci vel virides, in ovariis prominentibus. Sepalum dorsale late lanceolatum, vix 2 mm. longum. Sepala lateralia angustata, divergentia, circiter 2½ mm. longa. Petala sepalo dorsali breviora, falcolanceolata. Labellum lanceolatum, acuminatum, recurvum, marginibus laevis, vix 2½ mm. longum. Columnae appendices inaequaliter bilobati, lobus anterior brevissimus. Anthera appendicibus altior.*

A very slender plant, in my specimens about 13 cm. high. Free lamina of the bract very short, close to the spike. Flowers extremely small, 12-15, brownish or green, on prominent outstanding ovaries. Dorsal sepal broad-lanceolate or nearly ovate, under 2 mm. long; lateral sepals narrow, divergent, about 2½ mm. long. Petals shorter than the dorsal sepal, falcate-lanceolate. Labellum in the dried specimens much darker than the other segments, hardly as long as the lateral sepals and recurved between them, lanceolate-acuminate, with a relatively large cleft callus; margins entire. Column-appendages very unequally bilobate, the anterior lobe very short, the posterior one scarcely as high as the anther. Stigma in my specimens very obscure, apparently ovate.

Kumarl, via Esperance, Western Australia, L. Horbury, 5/1938. (Type.)

My specimens were received from Lieut.-Col. B. T. Goadby, of Mosman Park, near Perth. The flowers are the most diminutive of any species known to me, and it was only after softening out a whole spike that I was able to make out details by investigating about six individuals. Even so, careful examination of fresh material may prove the above description to be faulty; but I do not think it likely that the specific rank of this tiny flower, the first of its kind to be recorded in W.A., will be challenged. I have named it in honour of the discoverer, Mr. L. Horbury, formerly school teacher at Kumarl, where he recorded a number of interesting terrestrial orchids.

2. *PRASOPHYLLUM ELMAE*, *sp. nov.—Planta moderate robusta, 8-18 cm. alta. Bracteae lamina prope spicam, inter flores protrudens. Flores 4-30, virides maculis coccineis. Sepala fere aequalia, circiter 3 mm. longa, ad apices plerumque glandulifera; sepalum dorsale latissimum; sepala lateralia late divergentia, ad bases maculis coccineis. Petala breviora, lanceolata. Labellum viride in unguicem coccineum; lamina oblonga, apiculata, margini-*

bus laevibus vel undulatis: callus latus, canaliculatus. Columnae appendices inaequaliter bilobati; lobi variabiles, anterior coccineus. Anthera apice deflexo; rostellum parvum; stigma ad libram ovatum.

A moderately robust species, 8-18 cm. high. Bract just below the spike, its free lamina often intruding among the flowers. Spike not very dense, but the number of flowers ranging from 4 to about 30; ovaries standing well out from the axis. Flowers light green with crimson-lake dots and tints. Sepals all approximately equal, about 3 mm. long, the dorsal one much broader than the widely-diverging laterals, which are crimson-dotted at the base. Petals shorter, lanceolate. Labellum green on a crimson-dotted claw, oblong, apiculate; margins entire or minutely and irregularly crenulate-undulate; callus broad, channelled. All segments usually gland-tipped; no cilia present. Column-appendages unequally bilobate, the lobes very variable in dimensions, the anterior one reddish. Anther with a deflexed and shortly filiform tip. Rostellum rather small; stigma horizontally and very broadly ovate.

National Park, Port Hacking, N.S.W., Mr. and Mrs. E. Nubling, 3/5/1927 (type); 6/3/1928; 10/3/1929, 16/3/1929. Same collectors, La Perouse 6/4/1929.

This species appears to have affinities with *P. viride* Fitzg. and *P. aureoviride* Rupp: but the labellum is quite different from that of the former, and it is a much more robust plant than the latter, which has flowers of a bright golden-green without any crimson markings. It was the intention of the late Dr. Rogers to name this species in honour of Mrs. (Elma) Nubling, who found the first specimens; and it is with pleasure that I carry out that intention.

3. *PRASOPHYLLUM NICHOLLSIANUM, sp. nov.—Planta P. longisepali Fitzg. similis, 12-18 cm. alta. Bracteae lamina longa, proxime spicam. Flores pauci vel numerosi, fuscorubri vel flavovirides, in ovariis longis et prominentibus. Sepalum dorsale circiter 3 mm. longum, cucullatum, fere oblongum, ad apicem glande lineari. Sepala lateralia 5-6 mm. longa, late linearia, ad apices glandibus. Petala breviora, latissima, in medio plerumque vitta lata. Labellum anguste oblongum subito ad apicem contractum; callus magnus, fuscus, in dimidiam partem marginibus inflexis. Columnae appendices albi, lati, bilobati; lobus anterior angustus, acuminatus; lobus posterior magnus, obtusus, aliquando emarginatus. Anthera oblonga, ad summum plana cum filamentum longum. Rostellum parvum, stigma late ovatum.*

Plant resembling in habit and general appearance *P. longi-*

sepalum Fitzg. but the flowers smaller and the labellum and other details quite distinct; 12-18 cm. high. Lamina of the bract emerging at the base of the lowest ovary in the spike, long, sometimes exceeding the inflorescence. Flowers few or occasionally numerous, brownish-red or yellowish-green, on long and prominent ovaries. Dorsal sepal about 3 mm. long, cucullate, almost oblong, with a short linear gland at the apex. Lateral sepals 5-6 mm. long, broad-linear, usually gland-tipped. Petals shorter, unusually broad, generally with a broad band along the median line and a gland at the tip. Labellum narrowly oblong, suddenly contracting to an almost acute apex. Callus large, darker than the lamina, its posterior half with upturned margins which terminate very abruptly. Column-appendages whitish with faint red tints, wide, bilobate; anterior lobe narrow and acuminate, posterior lobe large, obtuse, sometimes emarginate. Anther with a flat top, oblong, a rather long filament emerging from the top. Rostellum small; stigma broadly ovate.

Loftus, near National Park, N.S.W., in sandy soil, Mr. and Mrs. E. Nubling, 5/1929. (Type.)

The species is named in honour of Mr. W. H. Nicholls, of Footscray, Melbourne, whose orchidological work is so widely known and appreciated, and who has given much attention to the section *Genoplesium*. The unusual form of the anther would alone suffice to distinguish this from other species.

4. *PRASOPHYLLUM UNICUM, sp. nov.—Planta gracilis, 10-13 cm. alta. Bracteae lamina plerumque brevissima, prope spicam. Flores 2-15, non laxe patentes, rubrovirides. Sepalum dorsale 3 mm. longum, non magnopere cucullatum, oblongo-acuminatissimum, plerumque marginibus incurvis. Sepala lateralia vix 5 mm. longa, ad bases gibbosa; lanceolata, acuminata. Petala angustata, sepalo dorsali breviora, acuminatissima. Floris segmenta omnia ad apices glandulosa. Labellum cochlearioides cum apice filiformi et marginibus laevis; callus crassus, bipartitus. Columna obscura; appendices acuti, non bilobati.*

A slender plant 10-13 cm. high. Lamina of the bract usually but not invariably very short, close under the spike. Flowers 2-15, on ovaries standing well out from the axis, not widely expanding, green with reddish or yellowish tints. Dorsal sepal about 3 mm. long, not very conspicuously cucullate; oblong for more than half its length, then almost angularly narrowing to an extremely acuminate or filiform point. Lateral sepals hardly 5 mm. long, gibbous at the base, lanceolate-acuminate. Petals narrow, shorter than the dorsal sepal, finely acuminate or filiform towards the tips. All floral segments (including labellum) usually gland-tipped, but the gland on the dorsal sepal very minute. Labellum spoon-shaped, but with a filiform apex; margins entire; callus thick, dark-reddish, bipartite from the base, the two segments parallel and not meeting anteriorly. Column obscure, and very difficult to examine owing to its protection by the petals and the inturned margins of the dorsal sepal; appendages acute, broad below, not bilobate.

Normanhurst, near Sydney, in sandy soil and moss under *Melaleuca* trees. E. Nubling, 6/1942. About ten plants seen.

I have named this remarkable species "unique," because it stands alone among all forms hitherto described, by reason of the filiform tips to the dorsal sepal and petals, and the singular structure of the labellum, which resembles one of those little wooden spoons used for ice-cream, with a filiform point emerging from the top of the spoon. It would be difficult to suggest its nearest affinities. As will be seen from the date, this is a quite recent discovery of Mr. Nubling's.

5. *PRASOPHYLLUM SAGITTIFERUM, sp. nov.—Planta comparate robusta, 9-10 cm. alta. Bracteae lamina brevis, prope spicam. Flores pauci, comparate magni, in ovariis circiter 5 mm. longis. Sepalum dorsale circiter 5 mm. longum, cucullatum, late ovato-acuminatum, flavoviride cum venis rubris. Sepala lateralia lanceolata, 7-9 mm. longa, patentia, purpurea. Petala late lanceolata, sepalo dorsali breviora, flavoviridia cum venis rubris. Labellum unguiculatum, oblongum, acutum; lamina rubra cum marginibus ciliatis; callus bipartitus, sagittiformis. Columnae appendices breviter et nonnihil inaequaliter bilobati; lobus anterior brevior, acutus, ciliis rubris; lobus posterior pallidus, obtusus. Anthera nutans; rostellum orbiculatum; stigma ovata.*

Plant 9-10 cm. high, relatively robust. Stem-bract with a very short lamina immediately under the spike. Spike short, few-flowered. Flowers relatively large, with purple, red, and yellowish-green tints, on ovaries about 5 mm. long, standing well out from the axis. Dorsal sepal about 5 mm. long, not very deeply concave, ovate-acuminate, yellowish-green with three dark veins, margins and point red. Lateral sepals lanceolate, 7-9 mm. long, spreading, reddish-purple. Petals broadly lanceolate but not narrowing much basally, shorter than the dorsal sepal, yellowish-green with red veins and margins. Labellum oblong-acute with an upturned point; lamina red with dark ciliated margins; cilia short near the base, lengthening towards the apex; callus V-shaped, dark red, its apex not quite reaching the labellum-apex; 5 fine diagonal veins extending from it on either side nearly to the edge of the labellum. Labellum-claw rigid. Column-appendages shortly and slightly unequally bilobate; the shorter anterior lobe acute, dark, ciliate; the longer posterior lobe obtuse, pale. Anther bent forward to a deflexed point. Rostellum circular, large. Stigma ovate, pale with a dark centre.

Road from Bell to Mt. Wilson, Blue Mountains of N.S.W., Mr. and Mrs. E. Nubling, 3/1929 (type) and 3/1930.

The specific name was suggested by Mr. Nubling from the arrow-head shape of the callus on the labellum. The affinities of this plant are perhaps chiefly with *P. Archeri* Hook.f., but they are very distinct.

6. *PRASOPHYLLUM WILSONIENSE, sp. nov.—Planta gracilis, 10-22 cm. alta. Bracteae lamina aliquanto sub spicam. Flores 6-26, nutantes, fuscorubri vel pallidiores. Floris segmenta omnia marginibus ciliatis, fimbriatis, vel dentatis. Sepalum dorsale circiter 2 mm. longum, cucullatum, acutum vel acuminatum. Sepala lateralia longiora, plerumque late patentia, ad bases gibbosa. Petala sepalo dorsali breviora, acuminata. Labellum unguiculatum, late ovatum apice apiculato; margines inaequaliter fimbriati vel aliquando aequaliter denseque ciliati; callus variabilis, plerumque anguste bipartitus, atro-ruber. Columnae appendices variabiles, sed semper profunde bilobati; lobus anterior fuscus, breviter ciliatus vel serratus. Anthera cordiformis; stigma ovatum.*

A slender plant 10-22 cm. high. Lamina of the stem-bract 2-4 cm. below the spike. Flowers from about 6 to 26, usually conspicuously bent over, but the ovaries less prominent than in other species described here. Flowers dark brownish-red, or occasionally paler. All the floral segments with ciliated, fimbriate, or toothed glandular margins. Dorsal sepal not less than 2 mm. long, cucullate, acute or acuminate. Lateral sepals longer, usually widely divergent, gibbous at the base. Petals shorter than the dorsal sepal, acuminate. Labellum clawed, broadly ovate with an apiculate upturned apex; margins irregularly fimbriate or sometimes regularly and densely ciliate; callus variable, but commonly narrowly bipartite, sometimes occupying the greater part of the upper surface of the lamina. Column-appendages very variable, but always deeply bilobate, the anterior lobe dark and shortly ciliate or almost serrate. Anther cordiform; stigma ovate.

Mt. Wilson, Blue Mountains of N.S.W., Mr. and Mrs. E. Nubling, 12/1927 (type) and summer months of several succeeding years.

A very interesting species, with all the floral segments and the column-appendages variably decorated along the margins with different fringings. There is superficial resemblance to *P. Woollsii* F.v.M., for which this might at first sight be mistaken. A coloured plate beautifully executed by Mr. W. H. Nicholls was very useful in checking the details.

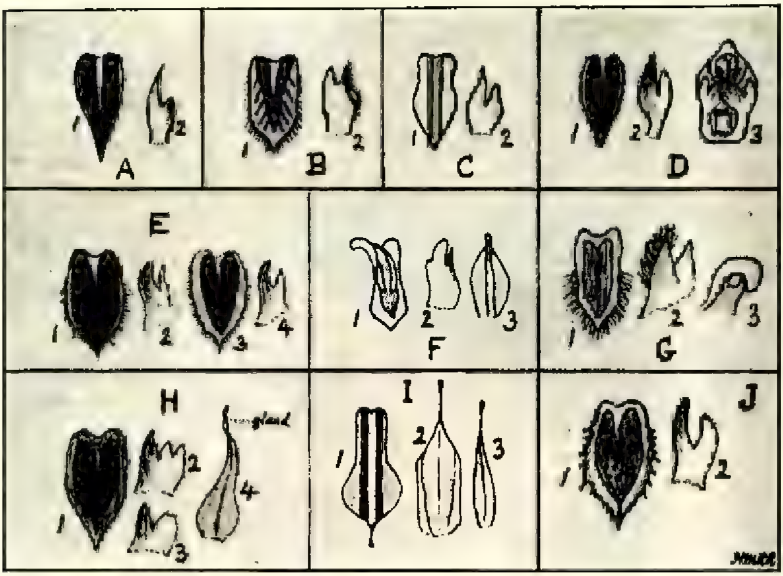
7. PRASOPHYLLUM PLUMOSUM, sp. nov.—Planta moderate robusta, 5-9 cm. alta. Bracteae lamina paullum sub spicam. Flores pauci, conspicue deflexi, virides notationibus rubris. Sepalum dorsale late lanceolatum, aliquando apice filiforme, sed plerumque circiter 7 mm. longum. Sepala lateralia longiora, ad bases vix gibbosa, late linearia, patentia. Petala similia sed parviora, acuminata. Labellum brevissime unguiculatum, oblongum vel anguste scutiforme, pallidum cum callum fuscious; margines prope basem laeves, deinde cum ciliis longis densisque. Columnae appendices lobis conicis profunde bilobati; lobus anterior puniceus, ciliis longissimis densisque plumosus; lobus posterior pallidus laevisque. Rostellum crassum et protrudens; stigma latissime ovatum.

A moderately robust plant up to about 9 cm. high. Lamina of bract a little below the spike. Flowers few, at first extremely deflexed, later becoming almost horizontal, green with red markings. Dorsal sepal very broadly lanceolate, sometimes with a long filiform point, but usually about 7 mm. long. Lateral sepals a little longer, scarcely gibbous at the base, broad-linear, divergent. Petals similar but smaller, acuminate. Labellum very shortly clawed, oblong or narrowly shield-shaped, pale with a broad darker callus; margins entire towards the base, but anteriorly densely fringed with long cilia. Column-appendages deeply bifid with conical lobes almost equal in size; anterior lobe pink, plumose with very long densely packed cilia; posterior lobe pale, not ciliate. Rostellum thick and protruding; stigma very broadly ovate.

Kurnell, Botany Bay, Mr. and Mrs. E. Nubling, 1/1928. About a dozen plants found.

The description of the labellum and column-appendages sufficiently explains the name given to this "plumose" species.

There is another form among those discovered by Mr. Nubling which appears to be distinct from any species hitherto described, but since only a solitary specimen was found, it would be wiser to defer publication under a specific name until further material can be obtained. In order to facilitate recognition, however, it may be well to describe briefly the salient features of this plant. It was found along Waterfall Creek in the National Park at Port Hacking. Height of plant about 28 cm.; length of inflorescence about $3\frac{1}{2}$ cm. Spike very loose. Lamina of stem-bract 8 cm. below spike. *Floral bracts apparently 2*, the outer one very narrow and elongate (in the lowest flower much longer than the flower itself). Flowers very small, about 3 mm. long, not widely expanding, green with reddish tints, and a white labellum with red callus and red ciliated margins. Cilia on the dorsal sepal, petals, labellum, and column-appendages. Appendages bifid, the anterior lobe dark, the posterior one white.



KEY TO PLATE

Prasophyllum, spp. (Sect. *Genoplesium*)

A. *P. Horburyanum*, sp. nov. 1, labellum, upper surface; 2, one column-appendage. B. *P. sagittiferum*, sp. nov. Figures as in A. C. *P. Elmae*, sp. nov. Figures as in A. D. *P. Ruppii* Rog., var. *menaiense*, var. nov. 1, labellum, upper surface; 2, one column-appendage; 3, column showing appendages crossed over the stigma. E. *P. Wilsoniense*, sp. nof. 1, 3, labella, showing variations; 2, 4, column-appendage, showing variations. F. *P. Nichollsianum*, sp. nov. 1, labellum; 2, column-appendage; 3, petal. G. *P. plumosum*, sp. nov. Figures 1 and 2 as in A. 3, rostellum with part of stigma below it. H. *P. trifidum* Rupp. 1, labellum; 2, 3, varying column-appendages; 4, petal showing twisted flagelliform gland. I. *P. unicum*, sp. nov. 1, labellum; 2, dorsal sepal; 3, petal. J. *P. Beaugleholei* Nich., from Mt. Irvine. Figures as in A. All greatly magnified. Drawings by Messrs. E. Nubling and W. H. Nicholls, and Miss G. Scrivener, have been freely utilized for this plate.

The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the Club was held on November 9, 1942. The President (Mr. P. Crosbie Morrison) presided and about 80 members and friends attended.

Mr. G. Coghill pointed out that the Club's losses over the three publications (Fern, Shell and Fungi Books) was only about £48, and suggested that the advertisement received was well worth that sum. He moved that the Committee consider the advisability of publishing a second edition of the Shell Book. The motion was carried.

THE KIMBERLEYS

An illustrated lecture on "A Trip to the Kimberleys" was given by Mr. S. R. Mitchell, the lecturer having recently visited the district (W.A.) in connection with obtaining supplies of corundum, an abrasive mineral. He showed by a series of photographs the general geography and geology of the district. Mention was made of the flora and fauna and the many adventures sustained during the trip. Conditions of travel were bad. The lecture gave to those present a good indication of the country in this north-western part of Australia.

After a number of questions had been answered, the thanks of the Club were accorded Mr. Mitchell.

REPORTS OF EXCURSIONS

Reports of excursions were given as follows: Bayswater-Ringwood, Mr. A. S. Chalk; Burnley, Mr. F. S. Colliver; and Lilydale-Mt. Evelyn, Mr. R. G. Painter.

ELECTION OF MEMBERS

The following were duly elected as ordinary members of the Club: Mr. G. P. Onyons, Mr. C. C. Griffiths; as country member, Mr. R. D. Kent; as associate member, Master Keith Leavold.

GENERAL BUSINESS

The President presented to those honorary members present certificates recently printed for this purpose.

Mr. Jenkins asked regarding the second crop of figs, and how they were fertilized. Miss J. W. Raff and Mr. Noel Lothian spoke on the entomological and horticultural sides, respectively.

On the Club's behalf, the President presented to Mr. J. H. Willis a suitably bound copy of the Fungi Book, as a token of appreciation of the work done by Mr. Willis as author of this book.

NATURE NOTES

Mr. V. H. Miller reported on sparrows eating bees. Mr. Noel Lothian stated this was of common occurrence in New Zealand and further stated that sparrows ate a large number of aphis. Mr. Morrison stated that sparrows would catch and eat cabbage white butterflies.

Mr. F. S. Colliver spoke on fossil jellyfish and showed a series of figures of the better-known species.

Mr. S. R. Mitchell spoke on the plant *Grewia polygama,* the so-called "dysentery cure," and read a letter from the C.S.I.R. re experiments now being made with this plant.

Mr. Noel Lothian mentioned a large nest seen in the Dandenong Ranges and asked if the wedge-tail eagle occurred there. Mr. J. H. Willis stated that a pair of eagles had nested for years near Tom Tregellas's log, and were well known in the district.

EXHIBITS

Mr. S. R. Mitchell—A series of specimens, including a crocodile egg, cotton-tree seeds, quartz flakes and aboriginal implements from the Kimberleys.

Mr. V. H. Miller—Orchids, including *Cymbidium Lowii, C. Schroderi, Cypripedium Hirbissium, Dendrobium nobile,* and *Coelogyne Dayana.*

Mr. H. P. Dickins—Nine studies of Australian flowers.

Mr. C. French—Garden-grown tea-trees; New South Wales and Tasmanian waratahs from the nursery of Mr. Woolrich at Olinda.

Mr. C. J. Gabriel—Fan-shells (*Chlamys asperrimus,* Lam.) dredged in Western Port Bay.

Mr. E. E. Lord—Assorted collection of marine life from Middle Brighton; black snake (3 ft.) killed on a building block at Ringwood, close to the highway; galls on *Goodenia ovata* from Belgrave.

Mr. J. H. Willis—Leafless shrub (*Bossiaea Walkeri*) from near Piangil, N.W. Murray. (First record for Victoria.)

Mr. Noel Lothian—*Acacia triptera,* Bth. (spurwing acacia) from near Wangaratta, coll. Sept., 1942.

Mr. R. G. Painter—*Brunonia australis, Callistemon citrinus, C. phoeniceus, C. Sieberi, Chamaelaucium axillaris, Calothamnus Gilliesii, Cassia australis, Dianella tasmanica, Eucalyptus platypus* var. *purpurascens, Leptospermum grandiflorum, Melaleuca decussata, Prostanthera aspalathoides, P. Walkeri, Sollya fusiformis, Sarcochilus Fitzgeraldii, Darwinia citriodora.* All garden-grown.

NOTES FROM THE TROPICS

The following notes have been forwarded by a member of the F.N.C., Pilot-Officer C. C. Ralph, as a result of his observations while on active service in North Australia and Papua.

In the Townsville area any number of aircraft taking the air at once disturbed the hawks (large) or eagles (small) in hundreds. They climbed high in the air and at a glance looked like fighter planes. Many newcomers were misled, thinking these were really aeroplanes. The small native doves were nesting everywhere, and I found one nest actually over the water in a nearby reservoir. The typical dove's nest of dry twigs is flat, often saucer-shaped, and seems such an inadequate home for the two fledglings. We stayed there long enough to find them first out on a bough and then safely away. They are very fond of nesting in the hollows of a paw-paw leaf. In the bush away from Townsville there is plenty of bird life. One bird in particular, reminiscent of our butcher-bird, made the early morning glorious with his song, but I was never out early enough to identify him. Scorpions in the bed-clothes made us wonder how long we would go without a sting. Apparently they come for the moist warmth created by us sleeping on the ground.

Over the ocean, between Townsville and Cairns, we could see miles of the red scum which arises, I imagine, from the coral reefs. This lay in streaks as far as the eye could see. In two places we saw pairs of the giant ray, easily distinguishable from the height we were flying, and many sea creatures which may have been whales, dolphins, or even sharks. As they were either single or in pairs, I rule out dolphins, and I think they were much too large for sharks. The interest lay in the vast numbers—every minute or two we would come into view of one, and we would be hardly over it when we came to another. Schools of flying fish also were easily discernible from the plane. If anyone wants the most spectacular sight imaginable, let him take a flight over the coral reefs on a bright sunny day. All the fire of an opal, and something else besides, is there.

Here at Moresby I was interested to find small kangaroos or wallabies. The aeroplanes disturbed them, and more than once we have seen them bounding across the aerodromes. As in the south, you pick them up with car headlights. Here the kapok trees are in flower and the poinciana is just coming out. They are amazing trees. Two weeks ago they were so dry as to appear dead, and now they are sprouting green and are half covered with the brilliant red and yellow. Everywhere you find the barking lizard or gecko; it remains very still, but is quick at avoiding any attempt at capture.

The road up the Owen Stanley Range, about which you have heard so much, is most spectacular. It passes the beautiful Rorona Falls (I notice the papers name it the Rouna) over which the waters pass to Sapphire Creek, one of the main tributaries of the Loloki. The high country near where the Japs reached in their advance is indeed beautiful. Orchids, mostly Cypripediums, grow very freely on the rubber trees, more freely, apparently, than in the natural bush. The rubber trees, I feel sure, come from Brazil, and the question arises—Have these orchids found a host they prefer to the native growth, or is it that the even spacing of the rubber trees gives them light and air more to their liking? In any case, the greater frequency of orchids on rubber trees is most noticeable. It is, of course, easier to see them among the rubber, but this is not the only factor, as I have looked too closely among the natural timber to have missed many.

It is part of the day's proceedings, if one has the time to spare, to sit under the mango trees and wait for the fruit to drop. What is the explanation for the fact that they will drop in large numbers about sunset and only one or two at a time during the other parts of the day?

I was interested to see a coconut floating well out to sea, with a shoot on it standing at least 15 inches out of the water.

AT SHERBROOKE

Here, while the mists creep upward, smoky grey,
Above the ferns that crowd the gullies lush
And loud with bell-birds' chime and throb of thrush,
Here on the higher hills comes in the day.
Here breezes teach the forest trees to pray,
Set them a-tremble, breathless at the brush
Of angels' wings, and bid the bell-birds hush
Their chime, and steal the thrush's note away.
Silent we stand, the forest trees and I,
(Gold of his voice and silver of his plume!)
Worshippers at the Lyre-bird's display.
How shall we have again the ear or eye
For bird or song of earth—or bush or bloom?
A god is dancing on the hills to-day.

W.L.W.

(The foregoing lines have been written, "in all humility," by a member of the F.N.C. who "used to think an orchid the only thing in the bush worth looking at," but who changed his mind after seeing and hearing a Lyre-bird perform on a mound in a mist-laden gully—this as late as October 20.)

The vernacular name, "Greater Flying Phalanger," used on an illustration in the November *Naturalist*, was erroneous. The mammal represented was the Yellow-bellied Possum-Glider, or Flying Phalanger, *Petaurus australis*.

FERNS IN MINE-SHAFTS

By R. W. Bond, Melbourne.

A letter which throws some further light on the subject of ferns growing in mine-shafts in dry districts (*V.N.*, Jan., 1934) has been brought to my notice by Mr. J. H. Willis. It was written on the 29th October, 1861, to Baron von Mueller by Mr. J. Fisher, of Creswick, the district referred to in the notes previously published. The relevant sections of Mr. Fisher's letter are:

> I enclose for your inspection a specimen of what I take to be a fern and beg to state that I am prompted to do so on account of the somewhat extraordinary place in which it was found. The plants are found in a line of deserted shafts—which have been abandoned for about four years—from about 6 to 12 feet from the surface; and I am somewhat at a loss to conjecture the reason of its being found in such a position when I take it into consideration that there is not the slightest indication of the same plant and, so far as I could see, of any of its species on the surface at or near the place where it is found. Indeed, so far as my memory guides me I have not seen the same description of flora growing in this Colony. It grows with long straggling roots on the sides of the shafts in a stratum of gravel and light loam, and it would be an interesting experiment to try whether the seed has been lying in this stratum for some considerable time and germinated upon exposure to the atmosphere.
>
> Should you consider it worth your attention, I shall be happy to afford you any assistance in my power, either in obtaining a portion of the stratum for experimentalysing upon or plants.

It will be noted that the writer makes particular reference to ferns in the shafts which he has not seen above ground. Unfortunately, we do not know the actual species seen, but it is probable that the plants were *Polystichum aculeatum*, *Blechnum* spp., or *Histiopteris incisa*, which are at present to be found in shafts in the district, and could be found with "long straggling roots on the sides of the shafts in a stratum of gravel."

The chief point of interest, however, is that the letter mentions the rapidity with which ferns established themselves in suitable shafts—sufficient to evoke comment within ten years of the establishment of mining operations in this area—and offers proof that, as would be expected, these mine-shaft fern species were never found in the district under normal conditions, which they enjoy only in comparatively well-watered forest areas and under cooler climatic conditions. These conditions are simulated in the shafts, which also provide good sites for rapid development of fern-spores which lodge on the freshly cut, moist surfaces bare of other plant growth and litter.

The suggestion that "the seed has been lying in this stratum for some considerable time and germinated after exposure to the atmosphere" must be regarded as out of the question. Fern-spores usually have only a short period of viability. It could not be regarded as possible that spores should have lain dormant since the last geological upheavals in the Creswick area, a time of large streams which left deposits of boulders and gravel (and gold!); and if the spores have found their way into the ground from the surface in rain-water they must have come from other districts in the wind, only a short period before germination.

Mr. Willis states that records kept after the great Krakatau eruption of 1883 show that eleven species of ferns occurred in the devastated area within three years, obviously the result of wind-borne spores from the nearest land, Java and Sumatra, both lying about 25 miles distant.

A further comment on the notes published in 1934 may be worth adding, even at this late date. During 1934, the writer discovered one vigorous, though small, plant of *Sticherus tener* (R.Br.) Ching. (formerly known in Victoria as *Gleichenia flabellata*) in a shaft dug in a sluiced-out hillside south-easterly from Creswick, near Humbug Hill.

POISON PLANTS IN AUSTRALIA

By H. C. E. STEWART, Melbourne.

Considerable attention, of a spasmodic nature, has been given by botanists to poisonous qualities in Australian plants. In the main this inquiry has been prompted by the toxic effects on stock, and to a lesser degree on human beings. Results of past work are scattered in various records, but apart from occasional incomplete books by J. H. Maiden, F. M. Bailey, C. T. White and other authorities, no serious attempt has been made to bring later discoveries with all previous work on toxicity within the covers of an up-to-date reliable volume.

The Poison Plants of New South Wales, compiled under the auspices of the Poison Plants Committee in that State, by Evelyn Hurst, B.Agr.Sc., and recently issued, is the most important and informative treatise on the subject yet published in Australia. The publication is the outcome of laboratory investigations over some years under the direction of the Poison Plants Committee, together with the review and collation of existing Australian material on poisonous N.S.W. vegetation (a large percentage of which is interstate) and the records hitherto unpublished or inaccessible to general use.

Pasture plants have naturally formed the widest field of investigation, and of these it appears that harmful effects are contained more in introduced aliens than in the native vegetation. Many indigenous plants are shown by research to have points of advantage over those from other countries. Field diagnosis of plant poisoning is largely based on circumstantial evidence, but careful tests sometimes disclose that certain circumstances as to state of growth, the season, the part eaten, and other local conditions determine toxicity. For instance, trouble may be caused by the quantity of indigestible fibre eaten, or ingested ravenously. Exact knowledge is very far from complete, but the book shows the necessity for extended research into many suppositions. The book further emphasizes closer contact of the botanist with the man on the land. Signs can be seen of increased attention to drug possibilities in the native flora, and where large-scale synthetic production is not practicable the present isolation of Australia will undoubtedly stimulate the quest for new drug plants or substitutes.

The average nature-lover will learn that many widely-spread indigenous species are suspect, notably *Bulbine bulbosa*, *Burchardia umbellata*, *Anguillaria dioica* ("Early Nancy"), and *Stypandra* spp. The Emu-bushes, *Eremophila*, are declared to poison sheep, but no reason is advanced as to why the fruits of some species are supposed to be innocuous to emu digestion. The "Sugar Gum," *Eucalyptus cladiocalyx*, is found to produce hydrogen cyanide (HCN), and the juvenile as well as the mature leaves leave toxic effects on stock. Several of the Acacias evidence toxicity.

Among other legumes, species of *Swainsona* are credited with affecting the brains of sheep, one symptom being known by stockmen as "pea-struck" condition. Horse doping is alleged by the effects of *Swainsona luteola*. The Darling Pea, when eaten exclusively, excites the grazing animal with "a propensity to climb trees." Yet F. von Mueller regarded the plant as non-poisonous when cultivated, or eaten with other plants. The stinging nettle trees, *Laportea*, have spiny hairs which contain formic acid and are capable of inflicting considerable pain when touched.

The *Orchidaceae* seem remarkably free from toxicity; the only species mentioned, *Dipodium punctatum*, shows no positive evidence of poisoning.

Experiments undertaken in respect to the "Kimberley disease" in horses of North-west Australia are given in some detail. Producing the "walkabout condition" in horses, the disease was known to exist since early settlement of the Kimberleys, but the cause for a long time was unknown. Now it has been traced to the saponin in the "Whitewood" (*Atalaya hemiglauca*).

Proved data is submitted on the Cycads, including *Cycas*, *Bowenia*, and *Macrozamia*. *Macrozamia spiralis*, common to New South Wales, caused such heavy losses of stock "that leases were given up and the country affected by Zamia was cut off." Captain Cook's sailors were the first to experience "hearty fits of vomiting" on eating Zamia nuts. The sagacious aborigines pre-treated nuts of the plant by soaking the seeds to dissipate the deleterious principle, and they thrived on this diet in the nutting season. The survival of the ancient *Macrozamia* may be due in part to its poisonous attributes.

Of particular interest are the plants utilized by the blackfellow. The native chewing tobacco, "Pituri" (*Duboisia Hopwoodii*), was used by him in Central Australia "for poisoning rock-hole water in order to stupefy emus which drink there and render them easy to kill." *Duboisia myoporoides* ("Corkwood") was early found by the white man to contain mydriatic properties, and the plant is now one of the important sources of hyoscine. The sap of two unnamed species of *Grevillea* was requisitioned by the native to scarify the skin and form scars. The bark of *Acacia falcata* was one of the mediums he had for poisoning fish. *Acacia aneura* ("Mulga") is now known to have a virulent poisonous substance, which explains the use it had in aboriginal spearheads.

These references to aborigines in relation to noxious plants are not general. They tend to indicate, however, that re-discovery has to be made in the laboratory of qualities formerly common knowledge to the natives. Their "field work" and "gastronomical research" before civilization came on the scene is now being brought to light by science.

No serious investigation seems to have been carried out as to the influence of toxic plants on the native fauna. The oil of *Eucalyptus viminalis* ("Manna Gum") supposedly contains benzaldehyde. The mysterious mortality of the koala years ago may be attributable to its presence in an abnormal season. Reference is made to the fruits of the handsome *Melia azederach* ("White Cedar"), regarded as "distinctly poisonous to animals, but native birds are immune."

BAYSWATER TO RINGWOOD

We had a very successful afternoon on October 17, and noticed 16 species of orchids in flower, including the rather rare *Prasophyllum Brainei*, the Green Leek-orchid and a fine specimen of the great sun-orchid, *Thelymitra grandiflora*, almost extinct at Ringwood now. This is undoubtedly one of the most beautiful of our Victorian orchids. The common sun-orchids (*Thelymitra aristata*) were also fine specimens.

There were several young members present who were interested in entomology, and some time was devoted to collecting native bees, wasps and other insects.

C. FRENCH.

THE SECTION *GENOPLESIUM* IN THE GENUS *PRASOPHYLLUM* (ORCHIDACEAE)

By the Rev. H. M. R. Rupp, Northbridge, N.S.W.

Part II

It is generally recognized that few orchid genera present more difficulties to the taxonomist than *Prasophyllum*, a genus of approximately 80 species confined, so far as is known, to Australia and New Zealand. Nowhere within the genus are these difficulties so acutely felt by orchid students as in the section adopted by Bentham under the name *Genoplesium*.

Robert Brown had created a genus under this name, consisting of a single species, *G. Baueri*. Bentham remarks (*Fl. Austr.* VI, p. 344) that no specimen of this plant was known, and that the genus was founded on a drawing of Bauer's representing either an abnormal specimen, or one in which the segments had been confused. He transferred *G. Baueri*, then, to *Prasophyllum*, and included it in Brown's *P. rufum*, at the same time utilizing Brown's name, *Genoplesium*, for the section of *Prasophyllum* comprising the most nearly allied species.

While he was undoubtedly right in transferring *G. Baueri* to *Prasophyllum*, he was mistaken in his estimate of Bauer's drawing, and in his supposition that it represented an abnormal form of *P. rufum*. Bauer correctly depicted the plant, and his drawing is reproduced by Fitzgerald in *Austr. Orch.* II, 3. It is quite distinct from any other species, and has been collected in the central coastal areas of N.S.W. by Nubling, Scammell, Rupp, and others. Fitzgerald restored it to specific rank as *P. Baueri*. He was apparently doubtful (l.c.) of its specific distinction from his own *P. Deaneanum*, but subsequently recognized the validity of both (Moore and Betche, *Handbook of the Flora of N.S.W.*, p. 396).

The section *Genoplesium* consists exclusively of small, attenuated terrestrial orchids, usually with a solitary leaf sheathing the greater part of the stem, and emerging near the inflorescence in a bract-like lamina commonly called the stem-bract. The most frequent form of inflorescence is a terminal spicate raceme (usually referred to as the spike) of very diminutive flowers; sometimes these are very numerous, but the number of individuals varies greatly, and is often reduced to two or three.

The height of these slender little plants ranges from about 5 to 35 cm. It has been observed that some species continue to grow higher even after the flowers have passed maturity, as is the case with practically all Australian species of *Corybas* and *Chiloglottis*, though the habit is not invariable. Its purpose in the case of dwarf plants would appear to be to ensure the distribution of seed by wind; but that seems entirely unnecessary in the case of the plants now under discussion.

It is impossible to become acquainted with the morphology of these diminutive *Genoplesium* flowers without the aid of a powerful magnifier. To the casual observer using only the naked eye, most of them appear to be either entirely identical or so nearly so that to give them separate specific rank is merely "splitting hairs." This charge of hair-splitting is all too frequently made by people who have avowedly never studied the morphology of these plants, and who appear to have curious ideas of what should constitute specific distinction. They cannot understand, for instance, why botanists include a number of quite different-looking flowers in the one species, *Dendrobium teretifolium*, and at the same time insist upon splitting up these tiny *Prasophylla*, which "all look alike," into a number of independent species. Now it cannot be too strongly emphasized that *size and superficial appearance* are of little or no value as criteria of specific distinction. Morphological differences are the features that really matter. It is true that certain forms of *Dendrobium teretifolium* possess flowers more than twice as large as others, and of different colour. But the morphology of the flowers is identical in all cases, or so nearly so that the slight divergences are unimportant. Therefore all are kept within one species.

Turning now to the *Genoplesium* Prasophylls, it may be true that many (though certainly not all) look much alike to the naked eye—because the naked eye is incapable of detecting morphological details on so small a scale. But the diminutive size of those details has absolutely no bearing on their importance; in so far as their size is concerned at all it must be judged relatively to the dimensions of the flower itself. And if one flower has a shield-shaped labellum with densely fimbriate margins, and another has a narrow oblong labellum with entire margins, it makes no difference whatever to the importance of that distinction whether you can measure the labella in decimetres or whether you have to use millimetres. Size is nothing: morphology is everything.

The "pygmy Prasophylls," as they are often called, are of unfailing interest to those who will take the trouble to study them. Superficially, they seem so far removed from their robust relatives in other sections of the genus that one can hardly refrain from asking, Why not revive Brown's genus *Genoplesium*, and take them all out of *Prasophyllum*? The answer here also is given by their morphology. Under the magnifier, their floral structure is seen to agree so closely in essentials with that of the larger forms that generic separation would be inadvisable; and indeed, a few species of the section *Podochilus* may be regarded as intermediate links.

New South Wales appears to be the home *par excellence* of these pygmies. Although we may confidently expect the discovery of further species in the other States (and perhaps in New Zealand), it does not seem likely that the New South Wales total will ever be reached elsewhere. If the sixteen forms figured by Fitzgerald are accepted as valid species (but on this point more will be said presently), adding to them the other eight species since recorded in this State, we have twenty-four, and the present paper will increase this number to thirty. Victoria has eleven species, of which only four are not known in N.S.W.; Tasmania has five, South Australia three, Western Australia two, and Queensland four. Among those included in the Victorian and Tasmanian figures, however, is Lindley's *P. brachystachyum*, which W. H. Nicholls and others consider to be conspecific with Brown's *P. despectans*.

But the question has been raised: Are all the forms figured by Fitzgerald in *Australian Orchids* really valid species? Certainly a few have evaded the eyes of the keenest searchers ever since they were published more than half a century ago. Yet how could Fitzgerald have drawn them unless they existed? No one—certainly not the present writer—can fail to appreciate the magnificent work of Australia's first great orchidologist; but no man is infallible, and we know that Fitzgerald did make mistakes. Remembering how scanty were the aids to identification in his day, the marvel is that he made so few. But the point is raised here, because those of us who have been concentrating a good deal of attention on the *Genoplesium* Prasophylls have observed, at least in some cases, that the floral details *undergo appreciable changes of form* in the course of their brief existence, and are particularly liable to do so after being handled or transported by post. This makes one wonder whether all the species that have been described are really valid, or whether in any cases the same flower has been dealt with twice at different stages. A shrinkage of the labellum or the column-appendages can materially alter the appearance of the flower where everything is on such a diminutive scale. I am not saying that this has happened in the case of any of Fitzgerald's forms, although I confess to doubts about two—*P. transversum* and *P. eriochilum*. But in view of what has just been said, it is most desirable that all students of these "pygmies" who can do so should make careful sketches, on an enlarged scale, of the floral details, and should then watch for the possible occurrence of changes before the flowers wither.

Dissatisfaction is often expressed at the inadequacy of published descriptions: a specimen perhaps does not conform precisely to the description or illustration, and the collector complains of the difficulty of identification. But it should be realized that no description, however eminent its author, can reasonably be expected to be perfect. If Nature had turned out species each in a uniform mould, then they might be described perfectly; but Nature has done nothing of the kind. The grouping into genera and species is not her work, but man's; and although he makes it as "natural" as he can, there will always be difficulties. Every species inevitably exhibits variability—some, of course, to a far greater extent than others—and it would be impossible to provide descriptions covering every variation to which a particular species may be liable. All this applies with emphasis to diminutive flowers such as are under discussion.

(*To be concluded.*)

THE WHIPSTICK REVISITED

By A. J. TADGELL, Melbourne

Once in a while the Whipstick Scrub, near Bendigo, excels itself in floral wealth. This season is one of those exceptions. Last year was droughty, but this is the season of plenty and abundance. In September I visited the northern end of this delightful forest and was rewarded with those glimpses of our Mallee growth when Nature's garden smiles upon you everywhere.

My companion was one of the younger and new members of the Club whose uncanny sense of locality and observation allows you to know where you are and to whose bush eyes and instincts nothing is lost. A bird flashes by and instantly you are told its name and habits, or you are shown its nest of two eggs. Of course I miss sometimes as I am botanizing in the "mystery" paddock where there is so much of interest to me. Adding up my list I find I have collected 100 species of plants.

There is *Pittosporum phyllyraeoides* standing like a sentinel against the sky-line—and what a pretty mottled bark! *Myoporum deserti* is in flower. *Eucalyptus Froggatti* is a species we have been searching for, and so is the *Melaleuca pubescens* (*M. parviflora*). We find *Acacia brachybotrya* also an object of long search. *Cassia Sturtii* is in flower. While we find *Dodonaea cuneata* in full fruit, *Dodonaea procumbens* (which is a rare find) has not yet shown any signs of flower other than its sticky foliage. Is it out of place? It is supposed to be only a hillside plant of the N.E. and S.W. of Victoria. There is a *Eutaxia*, often lowly and spinescent, but here nearly three feet high. It is rather late to find *Caladenia caerulea* in flower, with *C. carnea*. *Prostanthera aspalathoides* is not uncommon, and once seen is not forgotten.

This October I spent a happy day at the south end of the Whipstick, where the floral wealth persists. Here was found by Mr. Perry, my companion, the rare white form of *Boronia dentigera*, formerly called *B. anemonifolia*, while I was delighted to find the equally rare white form of *Dampiera lanceolata*, usually a beautiful and striking purple. Not far distant I found *Diuris brevissima*, which Mr. W. H. Nicholls described recently in the *Naturalist* as so lovely and closely approximating *D. palachila* or *D. maculata*.

THE EYES OF THE BUSH

(Summary of lecture given to the F.N.C. by Dr. Kevin O'Day)

The paper discussed only the eyes of the vertebrate family. The usual organ is present in a highly developed form in a very primitive vertebrate—the lamprey. Its form and function depends largely on the habits of its possessor—in the fishes, for example, whose range of vision is restricted by the medium in which they live, the eye is normally focused for near vision; that is, the fish is short sighted. Animals active in the bright light of day usually possess very keen vision and an apparatus which will focus the eye accurately. The nocturnal animal is not able to see fine detail, but is very sensitive to low degrees of illumination. It has been suggested that some may have eyes sensitive to a wider range of wave lengths than is the human. Animals such as the marsupial mole and the blind snake, content to live in a medium devoid of light, possess eyes which have lost most, if not all, of their usual visual function.

In the eyes of the Australian fauna the field naturalist will find much to interest him. Birds and reptiles, two allied groups, are the greatest sun-lovers amongst the vertebrates. Vision with them is a highly-developed sense. Their eyes are truly enormous in proportion to the size of their heads and the rest of the body. The area of the clear part of the eye, the cornea, which is visible, gives no indication of the size of the structure behind it. Most of them, like man, possess a central area of acute vision—the macula—of which some birds have two. Anatomically there is reason to believe that the vision in birds is more acute than that of man. In passing, it is of interest to note that the macula almost universally present in birds and reptiles is confined, amongst mammals, to man and a few monkeys. As a group, mammals shun the light of day, preferring the twilight or the shades of night, when the visual sense is severely handicapped and subsidiary to other senses.

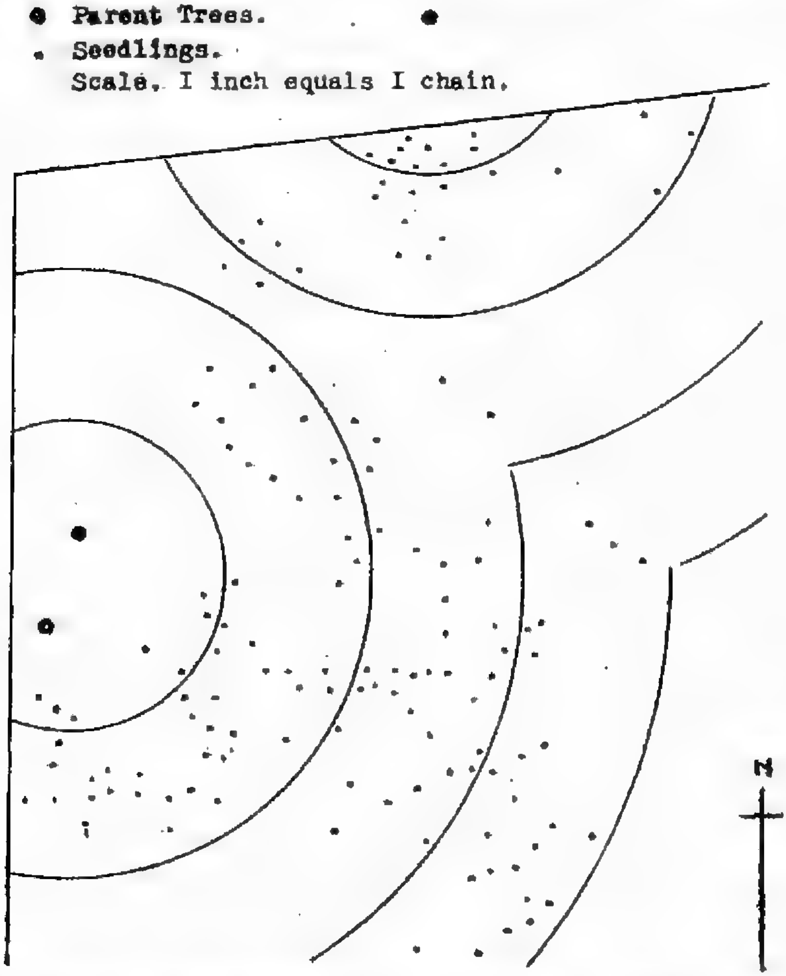
Speaking generally, nocturnal animals may be recognized by their prominent eyes. This definition is a little misleading, as it is not the eye itself which is enlarged but the cornea in relation to the rest of the eye. The explanation is fairly obvious—the cornea or window of the eye is made large to collect as much light as possible. For this reason the eyes of our marsupials are prominent features, as they are also in the geckos, one of our two families of nocturnal reptiles. So prominent are they in the latter case that a camouflage is often adopted to hide them. The colour of the iris merges into the coloration of the rest of the head, so that the large eye is not at all a prominent feature. This feature is particularly well seen in some of the snake-lizards (*Pygopodidae*), our other nocturnal family of lizards.

The smaller lizards are a very interesting group. Their eyes are very well-constructed visual organs. Living very close to the ground, they are confronted with difficulties which they have managed to surmount in a brilliant manner. Their eyes are in constant danger from dust and sand, and the lids must be closed frequently to protect the sensitive cornea. Many of them possess lower eyelids as transparent as the cornea itself, and can see as well with the lids shut as open.

In the burrowing types of lizards the lids remain permanently closed and transparent. The snake-lizards possess lids of this type (spectacles), as does the gecko. The spectacle, of course, is a characteristic feature of the snake's eyes, and gives it its baleful stare.

A TRANSECT STUDY OF THE FLIGHT OF SEEDS OF THE MURRAY PINE

By W. J. ZIMMER, Dip.For., F.L.S., Wangaratta, Victoria



Successful examples of natural regeneration of Murray Pine (*Callitris*) in Victoria are so uncommon that an opportunity was taken in 1938 of recording certain information which was made available by such an occurrence near Mildura.

It must be noted that rabbit-proof fencing permitted seedlings to become established within the enclosure. Outside the fence, which was accessible to both rabbits and hares, no regeneration occurred.

The data collected in this study is of some importance because it reveals, among other things, the distance that primary belts of trees of this species should be established in any measures that may be taken to re-clothe denuded timber areas in the red-brown soils of the Mallee. The conclusion to be drawn is that, where broadcast sowing is compelled by the total absence of seed trees, the belts should be about eight chains apart and placed to suit the topography and soil types of the region concerned.

A plan of the area, drawn to scale, is presented and the ensuing summary of information should be construed therewith:

Date of Study: November, 1938. Average height of seedlings: 13 ft. Regeneration commenced: 1924. Number of seedlings: 138.

Seedlings distributed as follows:

Zone 1 (within 1 chain of parent trees)	16
Zone 2 (between 1 and 2 chains from parent trees) ..	63
Zone 3 (between 2 and 3 chains from parent trees) ..	36
Zone 4 (between 3 and 4 chains from parent trees) ..	23

Area seeded by 3 parent trees, approximately 2 acres.

Height Classes:

The first figure indicates the height in feet of the seedlings. The figure in parenthesis represents the number of seedlings belonging to that particular height-class.

1 (1), 2 (1), 3 (1), 4 (2), 5 (1), 6 (7), 7 (2), 8 (5), 9 (7), 10 (13), 11 (8), 12 (15), 13 (15), 14 (16), 15 (13), 16 (5), 17 (10), 18 (3), 19 (5), 20 (8).

In connection with broadcast sowing, experiments conducted indicate that deep covering of the seeds is undesirable. It was revealed in actual germination tests that seeds sown at depths of half-inch, one inch, two inches and three inches, have sufficient energy to permit of the cotyledons reaching the soil-surface, although the percentage of success falls away badly at three inches.

The cotyledons of seeds sown at four inches and six inches failed to reach the surface and perished in spite of the fact that the germination had been quite good. These experiments also showed that the average percentage-fertility of the seeds of the Murray Pine could be assessed at about one-third.

Several botanical papers are held over from this issue. At present the chief need is for more contributions, both articles and paragraphs, of a zoological or general nature.

NATURAL HISTORY OF MELBOURNE

A symposium of outstanding Natural History features of the Melbourne district was held at the October meeting of the F.N.C. Here follow summaries of some of the botanical contributions to the discussion.

PLANTS OF THE BAYSIDE

Mr. H. C. E. Stewart referred to the world-renowned Sandringham flora, very little of which survives within reasonable distance of the city. The Coastal Tea-tree (*Leptospermum laevigatum*), once the glory of the near bay foreshore, had declined until the nearest natural examples occurred at Point Ormond. The speaker pleaded for more foreshore replanting of the tree by bayside councils and its general use as a hedge plant by seaside residents. Allusion was also made to a fine tree of *Eucalyptus ficifolia* in the Brighton Cemetery, and the formal plantation of Australian shrubs in front of the Melbourne Public Library.

PLANTS OF THE MARSHES

Mr. J. H. Willis emphasized the close affinity between the three major geological formations around Melbourne—basaltic plain, red sand, and hills of old Silurian rock—and the natural vegetation that these support. There were, however, other plant communities independent of general geology, e.g., the distinctive flora on coastal sand-dunes (a result of sea and wind) and that of saline marshes which could arise on widely differing substrata. The latter form the basis of Mr. Willis's contribution.

Owing to a high concentration of salt in certain damp, low-lying areas, only those plants with peculiar adaptations can thrive in such a habitat—notably succulent members of the "goose-foot" family (*Chenopodiaceae*), which impart a characteristic facies to such areas. There occurs, well within the four-mile radius from the heart of Melbourne, an excellent survival of salt-marsh vegetation, viz.—at the mouth of the Yarra just west of Port Melbourne. Here botanized the Baron von Mueller in the 1850's, and F. M. Reader in the 'nineties, each adding several interesting records to our Victorian flora. Naturalists are still assured of a profitable afternoon's hunting in this close but neglected field.

Municipal rubbish tips are slowly encroaching on the swamps at Fishermen's Bend, though it is doubtful if they will ever reach the Yarra mouth itself, and if one would prefer a less restricted field, why not take the 1/1½ return rail fare to Seaholme? A mile walk back along the beach to Kororoit Creek (Williamstown racecourse) leads one past virgin marsh where some 80 different flowering plants may be gathered; more than half of these are indigenous, including most of the typical salt-marsh inhabitants to be found anywhere in Victoria, yet the little "pigface" of Port Melbourne is apparently absent. To reach the Kororoit, one pushes through a waist-high forest of *Arthrocnemum* and treads with a queer feeling on the squashy-yielding carpet of Beaded Glasswort (*Salicornia*). At the creek bank a long line of healthy mangroves extends out seaward—the botanical highlight of the excursion! Mangroves are essentially tropic by nature, and to have an outlier of them flourishing within six miles of Melbourne City is surely one of our most outstanding botanic features.

Time did not permit Mr. Willis to enlarge on the amazing *pneumatophores* or aerial breathing roots, nor on the strange, square mangrove crabs (*Graphisura*) which burrow among them. There is no clear-cut flowering season with swamp plants, which are independent of water supply, and he had no hesitation in recommending our suburban salt-marshes to fellow-naturalists as a source of much interest at any time of the year.

The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the Club was held on December 14, 1942. The President (Mr. P. Crosbie Morrison) presided and about 80 members and friends attended.

SUBJECT FOR THE EVENING

An illustrated lecture "One Antarctic Day," was given by Mr. C. A. Hoadley, C.B.E., M.Sc. The lecturer had been with Sir Douglas Mawson (then Dr. Mawson) in the Antarctic, and the slides shown were from photographs taken at the time. A very fine series showing ice structures, the various types of penguins and their rookeries, as well as other animal life and general photographs of various members of the expedition at work, formed the basis of a running commentary that gave to those present one of the most interesting lectures we have had at Club meetings. On the Club's behalf a vote of thanks to Mr. Hoadley was moved by the President, seconded by Mr. E. E. Pescott, and carried by acclamation.

CORRESPONDENCE

From Mr. F. Lewis, Chief Inspector of Fisheries and Game, stating that Butcher-birds are not protected and therefore killing them is legal.

Letter from Club Member Les Fuaux, at present "Somewhere in Australia," containing remarks on mosquitoes.

REPORTS OF EXCURSIONS

Excursions were reported on as follows: Botanic Gardens, Mr. H. C. E. Stewart; Eltham, Mr. A. S. Chalk.

NATURE IN THE NORTH

The President accorded a welcome to Dr H. Flecker, a one-time member of this Club, more recently of Cairns and at present with the forces in North Australia. In a short address, Dr. Flecker described work being done for the war effort by naturalists of the northern parts of Australia. This included search for timbers, mosquito control, prevention of malaria and dengue, investigation of native fruits as an emergency food for troops, collecting of specified native plants for investigation by the C.S.I.R., and teaching of selected troops the uses of many species of our fauna and flora.

ELECTION OF MEMBERS

The following were elected as ordinary members of the Club: Mrs. L. Cochrane, Miss D. Murphy, Miss C. Codling, Mr. A. L. Brient, Mr. H. Preston; and as country member, Mr. M. A. Lawer.

FORTHCOMING EXCURSIONS

It was announced that the Altona excursion, listed for January 9 (1943), would be held on January 30, 1943, other arrangements being the same.

NATURE NOTES

Mr. V. H. Miller reported on mortality among small birds, and asked if it were due to the new pest destructors on the market. Other members reported similarly, and it was decided that the Committee make an investigation.

EXHIBITS

Mrs. M. E. Freame—Whale baleen, whale food, teeth of killer whale and sea elephant; painting of Mounts Erebus and Terror, map of Little America.

Mr. R. G. Painter—Garden-grown flowers, including *Boronia elatior*, *Brunonia australis*, *Callistemon citrinus*, *C. rugulosus*, *Calothamnus Gilliesii*, *Melaleuca hypericifolia*, *M. pulchella*, *Eucalyptus platypus* var. *purpurascens*, *Sollya fusiformis*, *Stenochilus maculatus*, *Thomasia petalocalyx*, *Isotoma petraea*, *Wahlenbergia gracilis*, *Blandfordia grandiflora*, *Hibiscus Huegelii* var. *Wrayae*.

Mr. A. D. Hardy—The hair-worm (*Gordius aquaticus*).

Mr. J. H. Willis—Some unusual Victorian timbers, viz.: Coast saltbush, samphire glasswort, scrubby blue-bush, tangled lignum, dillon-bush, quandong, dark turpentine bush, cushion-bush, thyme rice-flower, snowy mint-bush.

CURIOUS DISTRIBUTION OF PLANTS

The Brisbane Ranges (south-west of Bacchus Marsh) have been well worked by naturalists and frequently mentioned in this journal. Not least among their interesting features is the strange recurrence of an East Gippsland flora. Six shrubs, *Grevillea chrysophaea*, *Bossiaea microphylla*, *Pomaderris ferruginea*, *Leucopogon biflorus*, *Prostanthera decussata*, and *Olearia iodochroa* occur here, yet nowhere else west of Gippsland. On a recent trip to the area I collected no fewer than 320 flowering plants, including two new records which conform to the above rule, namely, *Poranthera corymbosa* and *Pomax umbellata*, both small East Victorian plants inhabiting barren stony slopes high up in the ranges.

The above instances are too numerous to be a matter of chance, and open up an interesting field for investigation: are we dealing with some remarkable conformity of soil and climate, or is it a question of survival from a once more widely distributed type of vegetation?—J. H. WILLIS.

THE BROWN SNAKE—DANGEROUS FELLOW

By DAVID FLEAY, B.SC., Director Badger Creek Sanctuary, Healesville

The following notes deal with some of the ways and peculiarities of the remarkable Brown Snake (*Demansia textilis*) which is a "non-conformist" in many respects so far as our common venomous snakes are concerned. However, a passing reference to Dr. C. H. Kellaway's conclusions on Brown Snake venom and its toxicity is as well to bear in mind. These are set out under four headings in the *Medical Journal of Australia* (Dec. 12, 1931), and summarized briefly they are as follow:

(1) The Brown Snake's venom is highly potent, though somewhat inferior in this respect to the venom of the Tiger Snake.
(2) It is powerfully neurotoxic (acting on the nervous system).
(3) The thrombin (clotting agent) is also very powerful, causing death in experimental animals by intravascular coagulation.
(4) The high toxicity of the venom accounts for the mortality caused by bites in man, which is unexpected in view of the poor venom yields and poor biting apparatus of this snake. It is stated, however, that even though the Brown Snake is a poorer venom-producer than members of other species, it must give considerably larger quantities of poison in the wild state than it does in captivity.

On account of the disappointing results of "milking" in this species, the manufacture of a specific antivenine has not been possible. However, I am informed by Mr. C. L. Ricardo, of the Commonwealth Serum Laboratories, Royal Park, that Tiger Snake antivenine may be used to counteract the action of Brown Snake bites, though it is of little use. It is probably the neurotoxic principle of the venom that may be neutralized, thereby giving a chance of recovery. The clotting agent, however, which is more powerful than that of Tiger Snake venom, would probably be responsible for death in the case of unsuccessful treatment.

Varying in colour from olive through light tan to almost white, the lithe Brown Snake is readily distinguished from other well-known species by its long, slim, whip-like form and small head. More particularly is it characterized by its amazingly rapid movements, for the "Brown" is a "racehorse" among snakes.

Widely spread in Australia, the Brown Snake is a lover of dry open plains and rocky sun-baked hillsides. Out in the wide spaces, where the shimmering heat waves dance across the fences and the ravens' calls are heard, there the Brown Snake is at home. It shuns the swamps and forested marshy places dear to the Tigers, Blacks and Copperheads. Typically a snake of the inland it is unknown in Tasmania.

Very closely related to it is the Collared Brown Snake (*Demansia nuchalis*), the dominant form in Western Australia. *D. nuchalis* is also found in South Australia, New South Wales, and occasionally in Victoria. In Western Australia this Brown Snake is familiarly known as the "Gwardar."

A study of our Brown Snake (*D. textilis*) provides more thrills than is usually associated with field observations in herpetology. Having captured many hundreds of snakes in a variety of places during the past twenty-five years (and, believe me, it can be a sport *par excellence!*) I have no hesitation in placing this fellow at the head of the list for downright ferocity, speed, and lightning striking movements when chased and cornered. Almost certainly all who know him will agree. Where the comparatively sluggish Tiger, the heavy-bodied Black, and the shy, nervous Copperhead may be captured by the expert with a certain degree of ease, it is an affair fraught with grave danger to interfere on a hot day with an active Brown Snake.

The four outstanding points of dissimilarity with its venomous brethren are its curious striking position, its method of hunting and killing its prey, its egg-laying habit and its insistence on a dry, sunny, well-drained habitat. Brown Snakes will not thrive in captivity, even in a large open-air park, should there be the faintest suggestion of lingering dampness about the soil. Shy and retiring, like most snakes until interfered with, a Brown Snake on the defensive is an extremely dangerous antagonist, providing a most spectacular display of action. Usually slightly more than a third of the fore-part of the body is raised exceptionally high off the ground, taking up a shape comparable to a compressed S. This characteristic attacking attitude, with the wicked little head facing forward above the lateral S bends, permits a lightning-swift and extremely lengthy forward lunge.

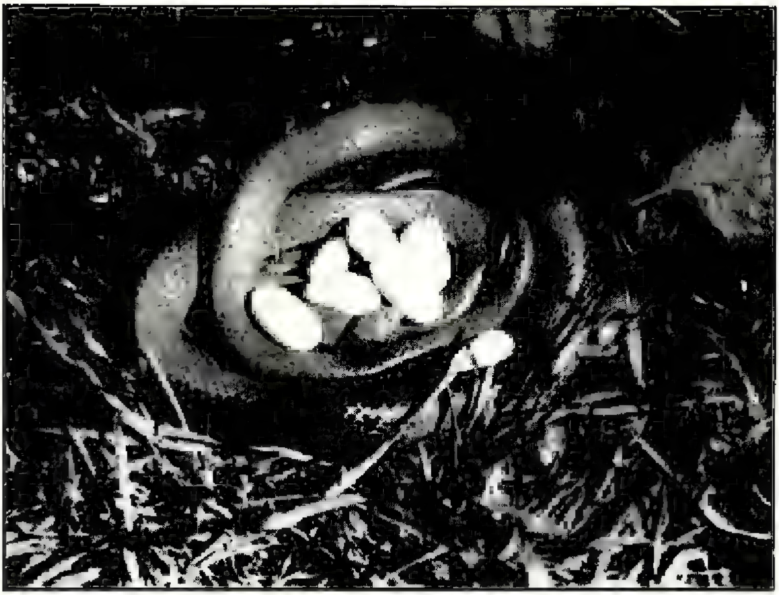
Quite unlike the Tiger, Black and Copperhead in this curious curving of its body, the Brown does not flatten its neck in anger and it is also unusual in striking with its mouth wide open.

Really large specimens, which have been measured up to seven feet in length, are thus formidable customers to capture. Striking from the typical elevated poise, they are liable to bite one above the knee.

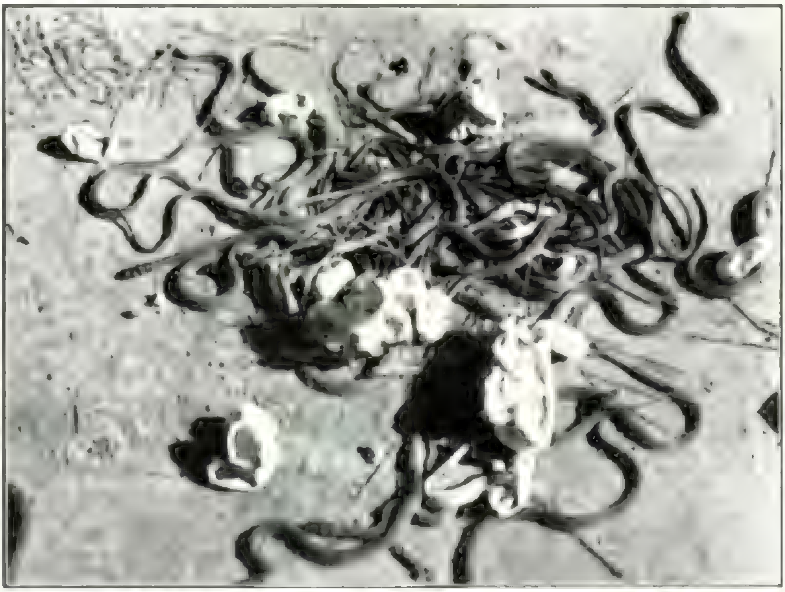
Leaving their "homes" only on very hot days to search for food, Brown Snakes move very actively, halting occasionally with raised heads to survey the landscape. Mice in the haystacks, young rabbits, rats, birds and occasional lizards are favourites on the menu. Frogs are disliked intensely. I have had reports of Brown Snakes killing young hares and even taking fledgling Bee-eaters or Rainbow-birds from their nursery tunnels.

This snake appears to hunt more by sight and not so much by smell, as in the case of other species. It is a striking thing to watch a questing Brown Snake raise its head and "spot" a moving bird

PLATE X



A Brown Snake five feet long coiled about her freshly-laid eggs. A sheet of bark had to be lifted in order to take this photograph.



"Snakelings" of *Demansia textilis* a few hours old and crumpled egg shells. Infantile black head-patches and cross-bars are noticeable.

Photos.: D. Fleay.

or small mammal fifteen or twenty feet distant. Galvanized into startling action, the reptile literally hurtles across the intervening space, and continues the chase even should the intended victim turn to flee.

The climax of the chase reveals one of the truly remarkable actions of the Brown Snake, for no sooner has it buried its fangs in its quarry than it instantaneously wraps a series of tight coils about the victim and remains motionless, still maintaining the relentless mouth grip. Minutes may pass before the circulating venom has had time to complete its deadly work and all struggles have ceased. This python-like envelopment of its victims is unique among the killing habits of our venomous snakes.

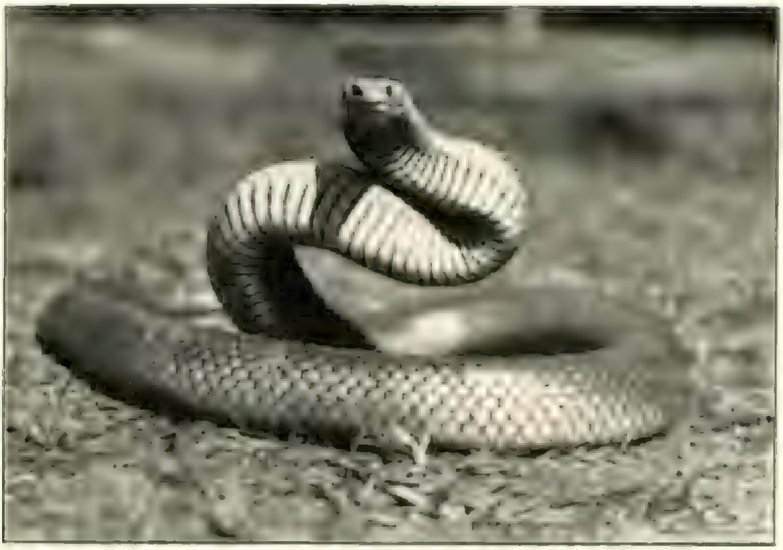
The late Mr. H. Pooley, of Barnawartha (V.), reported the discovery of a marauding Brown Snake neatly coiled about a pet Rosella Parrot inside the latter's cage. Another correspondent of *The Argus* Nature Notes column, Mr. Peter Hammerlit (Geelong, V.), wrote describing the fate of a leveret to which he was attracted by its agonized squealing. Gripping it in its jaws and at the same time maintaining a "fire-reel" coil about its body, was a very large Brown Snake.

When all struggles of its victim have ceased, relaxing of the encircling coils takes place and the snake investigates and considers the body with incessant flickering of its tongue. In swallowing its prey, the Brown Snake follows the usual head-first procedure, so that the victim slides in on a "streamlined" course. A reversal of the correct engulfing procedure which may occur when a snake is ravenously hungry is liable to have unfortunate consequences. Several years ago Mr. W. G. Mackrell, of Strathbogie, came across a small Brown Snake wriggling about aimlessly. It made no attempt to get away, and on a closer inspection Mr. Mackrell found that the snake's head was enveloped in the wings and feathers of a bird. When this "Brown" was killed it was discovered that it had begun to swallow a ground-lark (pipit) legs and tail first and the wings projecting on each side of the mouth had obstructed further progress. Evidently the attempt had gone on for some considerable time, as the toes and portion of the bird's legs had been digested. Usually it is not difficult for a snake to disgorge an awkward meal, but in this case the entanglement must have presented unusual difficulties.

As in the case of the Black Snake, evidence points to November as the mating month of the Brown Snake, and as in the case of the first-mentioned species, where rival males may battle fiercely in the remarkable "plaited rope" grapple, so do Brown Snakes fight when one has possibly infringed on the territory of another. Again, in its egg-laying habit—a feature at variance with the viviparous habits of Copperheads, Tigers, and Black

Snakes—the Brown Snake shows another point of similarity with the pythons or constricting snakes. The elongated, soft-shelled white eggs of the Brown Snakes are usually found, if discovered at all, in the debris of rotting logs or stumps, or in burrows. Numbering from 15 to 30 in a batch, they must remain hidden in a sheltered position with some degree of moisture. The sun's heat causes them to shrivel very rapidly.

In the only case I have observed of a female Brown Snake laying eggs in captivity, the reptile retired to a secluded position among grass and sandy soil beneath a large and heavy sheet of bark. Here she was discovered, when her absence of several days caused a search, coiled neatly about some fifteen eggs. This python-like attitude suggests to me that it is possible Brown Snakes curl about their eggs for part at least, if not all, of the incubation period, which possibly extends from two to three weeks. In the case observed the "sitting" snake deserted her batch because of a second upheaval of the covering bark sheet for the purpose of securing photographs of the unique sight.



Rearing up in anger, a six-foot Brown Snake prepares to strike forward with open mouth.

Photo.: D. Fleay.

In another case reported to me, a Brown Snake was discovered in a stump with eggs which were on the point of hatching.

At the time of hatching and up to a 2-ft.-long stage, young Brown

Snakes are prettily marked. They are yellowish or brown in general colour, while the top of the head is black except for the snout and a yellow bar behind the widest part of the head. The nape is also black and the rest of the body or some part of it may be marked with narrow dark cross-bars. As in the adults, the ventral shield scales are usually marked with pink or rust-coloured spots. This variable infantile camouflage, so necessary with kookaburras and many other bush birds constantly on reconnaissance, is gradually lost as the snakeling grows and sloughs its many coats. Newly-hatched Brown Snakes, being far too small to feed on even the smallest of birds or mammals, appear to seek out tiny lizards and insects as an early source of nourishment.

Sloughing of the skin in adult Brown Snakes, or in any venomous snake for that matter, takes place much more frequently than on the single occasion per season which is such a universal belief. In fact, as many as four to six sloughings may occur between the warm months of September and March. It is an interesting sight watching a snake emerging with obvious relief from its old coat, vigorously heaving and jerking its ribs at the succeeding points of contact between the progressively rolling back old skin and its body.

Skin sloughing in the case of an unhealthy snake may result in pieces of skin tearing off by degrees or in only partial shedding. Mr. W. G. Mackrell records a remarkable case of a skin-shedding Brown Snake that brought about its own death. This snake had evidently begun the sloughing process in a patch of coarse grass. However, the skin slipping back from the head failed to turn inside out easily. Instead it worked back in an ever-increasing and ever-tightening rope-like band with several grass stalks entangled in its folds. To these grass stalks the snake became thoroughly fast with no chance of further shedding its skin or of moving away. There it had died a lingering and miserable death.

As previously mentioned, the speed of the Brown Snake's movements exceeds that of our other venomous species such as the Tiger, Copperhead and Black Snakes. In fact, it is no exaggeration to claim that the Brown fellow is ten times as rapid in its movements as any of its contemporaries, and for a short distance in hot weather, when it is in top form, I have found by experiment that a Brown can travel practically as fast as the average man can run. On snake-catching trips to such places as the Stony Rises near Camperdown, the basaltic stone-wall country of Melton and Werribee, and the Riverina plains, I have many a time made futile dashes to overtake active Browns, but with cover anywhere near one rarely has much of a chance to overtake the fleeing reptiles before they reach a safe haven. Naturally if the retreat happens to be a small rabbit burrow or the cavity under a rocky slab then the capture of such specimens is still feasible.

Another interesting feature about the Brown Snake's habits is the fact that it is strictly diurnal, loving the hot, sizzling days, and unlike the Tiger and Copperhead it never wanders abroad even on the hottest of nights. Years ago, when camping at Hall's Gap in the Grampians, I had reason to be thankful for the Brown Snake's somnolence in the darker hours. I slept in an old bark hut on a pile of hessian strips. In the morning I discovered a fine "Brown" there. He had been beneath me all night long!

Several of the largest Brown Snakes I have captured were collected with ease by the simple means of digging out their retreats in decayed root-cavities and rabbit-burrows after nightfall when the drop in temperature had considerably reduced their fighting powers.

One of the finest specimens ever added to our Snake Park in the Badger Creek Sanctuary, Healesville, was chased "to earth" at Strathbogie on a hot day in 1939 by Mr. W. G. Mackrell. This enthusiastic naturalist carefully blocked up all possible exits to the system of old root-holes in which the snake had taken refuge, and then telephoned news of his "find" to me at Badger Creek. That same evening we made a return trip to Strathbogie —170 miles in all—for 6½ feet of Brown Snake. However, the long night journey (plus pick and shovel exercise) was well worth while, for this "grandfather" reptile, with numerous "plate scale" scars, indicating the old wounds of lucky escapes in its past life, was not only 6 feet 3 inches in length but 9 inches in girth, which is an outsize for this comparatively slim species.

FITZG. OR FITZG.?

Recently many Victorian botanists have written, asking me my authority for spelling the name of the "father" of Australian orchidology, R. D. FitzGerald, with a capital G in a biographical sketch I published in the *Vic. Nat.* many years ago. His eldest son, the present R. D. FitzGerald, now well up in his 70's, is a valued friend of mine, and a call on his time invariably means a half-hour of merriment. So I asked him to give to the Victorian naturalists his authority for the spelling of his name. The request called forth the prompt reply—

"To be spelt with a capital G
Is wot it's got to be."

Possibly, because the small g has been used for so long, the capital will take some accepting. In fact, one orchidologist went so far as to say that it will not be popular because it will take so much longer to write when you are in a hurry!

But if the family name is FitzGerald, the capital G must be used in future, not only on a plea of accuracy, but out of respect for the name of a very great nature-lover whose memory is dear to all orchidologists.

PEARL R. MESSMER (Lindfield, N.S.W.).

A TRIP TO THE KIMBERLEYS, W.A.

By S. R. Mitchell, Melbourne

A visit to the West Kimberley district, North-western Australia, was made by the writer and Mr. F. S. Forman, Government Geologist of Western Australia, last August and September for the purpose of investigating some occurrences of emery in the vicinity of Mt. Broome, and to arrange for supplies to be sent to Melbourne. Emery is an impure form of the mineral Corundum. Usually found as a granular rock, it is dark in colour, very dense, and extremely hard and tough. Its chief uses are as an abradent in grain or powder form for cutting and polishing metal, stone and glass, and for the making of emery cloth.

Leaving Melbourne by plane on August 23, at 6.40 a.m., Perth was reached that evening, and the following night we arrived at Broome—a total distance of 3,106 miles had been covered in two days. An hour's journey next morning brought us to Derby, a small town close to the mouth of the Fitzroy River.

Our destination being some 150 miles east of Derby, a start was made the following morning with a truck heavily laden with petrol, food, water and five companions. The Mt. House track was followed to Winjinna Gorge, about 105 miles east of Derby, which was reached that evening. The road first crosses the extensive marshes or mud flats of the Fitzroy River delta and then for several miles "Pindan" country, a sandy coastal belt with a profusion of Acacias, Strychnine bush, Cotton bush, Bauhinia, Baobab and Eucalypts.

For about 100 miles the flood plains of the Fitzroy and Lennard Rivers were then traversed. With the exception of an elevated rocky area near the Kimberley Downs homestead, the country is flat and well grassed, with a sparse scrub of Bauhinia, Eucalypts, and a few Boabab. On the frequent cane-grass areas travelling was decidedly rough, with an occasional dry water-course to cross. Several waterholes were passed, and owing to the lateness and dryness of the season waterfowl had congregated at them in large numbers. They included ducks, pelicans, cormorants, jabirus, brolgas and ibis, whilst on the plains bustards and emus were plentiful. A species of wallaby of a yellow colour, and with a remarkable turn of speed, was exceptionally numerous.

Small ground pigeons and bright-plumaged kingfishers with raucous calls were noted, but as none of us was an ornithologist a record of the many other species could not be made.

Kimberley Downs homestead, some 65 miles from Derby, is close to Mount Marion, a flat-topped "mesa" of slightly dipping beds of Permian age, containing some interesting marine fossils. This mesa was originally part of a plateau, and has been isolated by denuding agencies. The only other hills seen in this section were Mounts Percy and North, many miles to the south, the latter a dissected volcanic plug of leucite basalt.

Winjinna Gorge was reached at dusk. Later a full moon arose and illuminated the massive cliffs of Devonian limestone that rise sheer out of the plain to a height of 250 to 300 feet. These are portion of the Napier Range, a limestone ridge that runs in a north-westerly and south-easterly direction for about 100 miles. The Winjinna Gorge, or Devil's Pass, is a break in this limestone, about 100 yards wide, through which the Lennard River flows during the wet season, but was now a series of water-holes teeming with crocodiles.

Fruit-bats (flying foxes) were seen at dusk literally in hundreds of thousands streaming through the Gorge and making for the open country. They evidently nest in the hollows of the limestone during the day

A search near the Gorge yielded several flaked spear-heads in the process of manufacture, one being of translucent quartz; another a water-worn serrated example that had probably been used in spearing a crocodile was found on the shingle. The Lennard River is bordered largely with paper-bark trees and fig trees; most of the eucalypts close to the river have a white smooth bark like a ghost gum.

The route follows practically the course of the Lennard River to the Napier Range, which comes in from the north-east The limestone of this range is largely of coral origin, white in colour and very dense; all traces of organic remains have been obliterated, partly by dolomitization. The colour of the surface is a dirty grey, except where water has dissolved off the coating or stained it with iron oxide. Farther to the south-east the limestone becomes thinner bedded, and shows many fantastic effects of weathering, particularly the solvent effect of water in the fluted columns and pillars are capped by flat slabs, together with tier after tier of weird shapes and isolated pinnacles.

The Gorge was left next morning and the south-west scarp of the range followed to Carpenter's Gap on Fairfield Station. We passed over a floor of limestone which is thought to have been a sea platform, and was covered later by more recent deposits and so preserved. Farther on, Permian deposits cover this platform and these give place to a glacial till with facetted and ice-scratched pebbles and boulders present. Passing through the gap, the character of the country changes completely to a series of small plains one or two miles across, with sparse eucalyptus and bauhinia scrub and coarse grasses, surrounded by low hills of a brownish colour elevated 100 or 200 feet above the flats. These consist of the pre-Cambrian Mosquito Creek series of tightly folded quartzites, slates and chloritic schists, with numerous intrusions of a dark igneous rock identified in places as quartz gabbros and epidiorites. In the bed of the Richinda River staurolite crystals washed out of the schist were abundant.

After many tribulations, including car troubles, extreme heat, and difficult travelling, Ned's Camp, 28 miles from Fairfield, was reached, with Mount Broome showing in the distance. Having found that it was impossible to reach the deposit by car, the party returned to Derby.

Arrangements were then made with the police authorities, and Constable Jensen, two blacks, and a plant of five mules and two horses were sent out to Winjinna Gorge. Three days later Mr. Forman, old Ned, our guide, and I went out by car. Next day a start was made on riding mules, and 30 miles were covered over much the same class of country, passing Mount Joseph on our left. The midday stop was made at the Rocky Waterhole on the Lennard River. This day a fine chipped axe, some spear-point blanks, and one large chopper were found. We carried on till dark, with our guide obviously doubtful of his position. The natives were sent forward to search for the Turtle Waterhole, but as they were unsuccessful the party had to retreat for feed for the animals.

That night, being out of water, we opened a can each of pineapple, pears and turnips and divided them among six men, who drank the liquor, ate the fruit, and—went to sleep fairly thirsty.

Up next morning at 5.30, we started back six miles, but found the first waterhole dry, with a small soak made by a thirsty wallaby. The second waterhole had a dead beast in it, and the next contained just thick mud, so we had to push on 12 miles to the Rocky Waterhole, where we had our first decent drink in 18 hours. Our arrival disturbed hundreds of ducks perched on dead trees, flocks of screaming cockatoos, some very large black cockatoos, cormorants, etc. We passed many emus and one very large dingo during the day.

That afternoon we rested, and later the constable and blacks rounded up a bullock and we had grilled steak, which was very acceptable after salt and tinned food.

Next day we reached Winjinna Gorge, after a very hot day. Our aboriginal police boys found 20 crocodile eggs and later on 19 more. Although they had had plenty of meat, they ate 12 eggs each—which was not a bad effort. One could not wish for more cheerful or willing companions than these natives, who accompanied us for several days, riding the mules bareback during the hottest part of the day and helping in every way. The aborigines we saw on the station also seemed well fed and happy; they appear to be properly treated by the station managers and employees.

Next day we returned by car to Derby. A visit of inspection was made to the Derby Leprosarium, where 160 full-blood natives and 17 half-caste lepers were being treated. There is a very fine hospital, accommodation and gardens, and the inmates obviously are very well housed and looked after. Much credit is due to the organization, and particularly to Mr. and Mrs. Walsh, who are in charge.

Three interesting plants were noted on this trip. One is *Grewia polygama*, a small shrub known locally as the "Dysentery bush." A decoction made from its leaves has proved an excellent specific for dysentery, and this property was well known to the aborigines. The Strychnine tree, a member of the Euphorbiaceae, is a small tree with very bitter seeds, which are now being examined for anti-malarial properties. The Cotton tree is a tall shrub with a bright yellow flower and pleasant perfume. It has an ovoid seed pod about 2½ inches long, containing a cotton-like substance similar to the kapok of commerce.

A couple of days waiting for the plane from Hall's Creek and we were conveyed to Perth after two weeks in this very interesting part of Australia.

CRAB-MUSSEL ASSOCIATION

An example of commensalism on the part of marine mussels (*Mytilus* sp.) and a soft-bodied pea-crab (*Pinnotheres* sp.) was noted in specimens gathered at Rosebud on October 13, 1941.

The crab lives inside the mantle cavity of the mussel, obtaining its food from the flow of water set up by the mussel. A crab loaded with eggs was kept in a jar, with a small quantity of water, which was often changed. Food consisted of eggs of molluscs—Dorids egg-girdles, jelly mass found on the sand, and whelks' eggs from off the rocks.

The girdle was favoured as something to grip. As the two small hind claws were held in the air (probably used to grip the mantle of the mussel) the girdle was wound across the back and held by the two hind claws, the ends occasionally being held by the two front claws, which appear to be feeble and not capable of tearing anything.

On October 29 the crab made a furrow in the centre of the eggs and stirred them about. Many of the eggs fell off in the process but were picked up later and eaten; also, the crab scraped underneath the broad tail for the food, which by now had reached the veliger stage of the molluscs. After stirring the eggs, the crab lifted the upper portion of the body, and with several heaving motions—expanding and contracting sharply, then resting for a minute or two—scattered the young "zoea" crabs to fend for themselves. Altogether this occupied four days.

The tail of the young crab unfolds first. The tiny animal twirls furiously around in ever-widening circles, flicking the tail to release the membrane in which it is enclosed.

On November 10 the mother crab moulted.

M. E. FREAME

RE-DISCOVERY OF *CALOCHILUS SAPROPHYTICUS* (THE LEAFLESS BEARDED ORCHID)

By W. H. NICHOLLS, Melbourne.

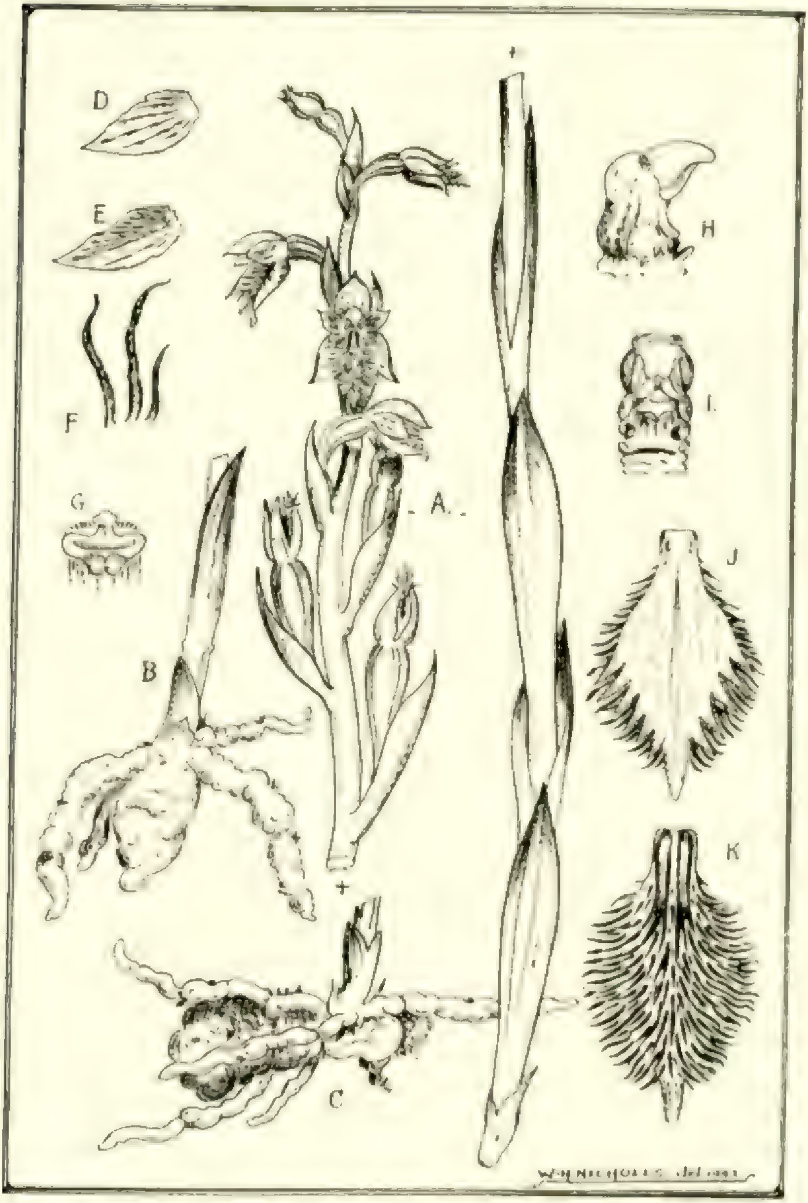
In a paper on *Calochilus campestris*, R.Brown, in this journal* the present writer alluded to the finding on several occasions in two widely-separated districts of intriguing, leafless specimens of a *Calochilus* which appeared to have some connection with the presumed very rare and unique *C. saprophyticus*, Rogers. These particular specimens at that time were considered, through inadvertence, to be valid *C. campestris* (= *C. cupreus*, Rogers). Reference was made also to some few abbreviated-leaf specimens; these were considered to be "transitory forms." But careful examination has proved them referable to *C. campestris*; also, in one or two instances, of specimens collected recently, to *C. saprophyticus*. The lower subulate bract in these instances of variation (and we must include also valid *C. saprophyticus*) is in reality an abortive leaf-lamina.†

C. saprophyticus was described by R. S. Rogers in *Transactions of the Royal Society of South Australia*, Vol. liv (1930), p. 41. This remarkable species was discovered in 1918, and again collected, from the same spot, in 1920 (two specimens only). Habitat: Cravensville, Tallangatta Valley, N.E. Victoria; collectors, Messrs. A. B. Braine and F. J. Supple. It is my pleasure now to record it from another part of the State, viz., Portland, in the south-west, where it occurs in abundance. The present discoverer is Mr. Clifford Beauglehole, who, with the assistance of his co-collectors (Masters L. Devlin and W. Phillips), has systematically combed the district for miles and has established the fact of its being widely spread there. Approximately 270 specimens have been recorded to date (December 10), some plants being of exceptional robustness. Habitats: Gorae West, Cashmere, Bridgewater (via Portland); in Melaleuca country; soil sandy, adjacent swamps; sometimes growing in water; much of the country burnt over early in the year.

Mr. Beauglehole also forwarded the complete rhizomatic system of several plants. This is interesting, for besides the normal tubers (in *C. saprophyticus* these are occasionally of most irregular formation) several extremely brittle, often attenuated, definitely jointed rhizomes were in evidence. The whole was very difficult to dig up intact from the tangled, compact mass of fibrous roots of shrubs which grow in the vicinity.

**The Victorian Naturalist*, lviii, October, 1941, p. 91.

†Rogers' description says: "Leaf incomplete in my specimens . . . . apparently lanceolate."



Calochilus saprophyticus, Rogers. (For Key, see page 159.)

Most probably *C. saprophyticus* has been collected by others but confounded with *C. campestris*, for these two species resemble each other closely. The long, channelled leaf which features all other species of the genus is absent in *C. saprophyticus*. Other salient points of difference between them are confined to the floral segments; these, of course, are not easily apparent unless a flower is dissected. However, the underground system is an additional and *certain* guide in the case of this anomalous form. This important find, therefore, has enabled me to clear up a most perplexing and interesting problem. So once again our sincere thanks are due to Mr. Beauglehole for his zealous endeavours.

Amended description of *Calochilus saprophyticus*, Rogers: A pale leafless (or practically so) saprophytic plant, often robust, 20-55 cm. high, with large thickened tuberous rhizomes, besides a large, often irregularly-shaped tuber (or tubers). Stem green or yellowish, with 2 membranous imbricate sheaths at the base. Bracts 2-4, yellowish pink, pale green or copper-coloured, subulate, about 6·7 cm. long—the lowest bract fleshy. Raceme 1-15, flowered; flowers subtended by a subulate bract, from 1·5-4 cm. long. Uppermost bract smaller than those towards the base of the inflorescence. Flowers stalked, not larger than those of *C. campestris* (which they resemble closely), pale green, segments suffused with saffron-yellow and marked with reddish-brown; labellum pale yellowish-green, hairs on labellum-lamina deep purple or reddish-purple. Dorsal sepal erect or incurved, widely lanceolate, subacute, cucullate, 5-nerved; lateral sepals spreading, falco-lanceolate, margins sometimes irregularly notched. Labellum spreading, sessile on an oblong base, somewhat rhomb-shaped, very shortly ligulate at the apex, about 1·3 cm. long (without the ligule, latter 2-4 mm. long), glabrous at the base, with two (sometimes more) raised deep blue metallic parallel plates, often bifurcated in front and produced into long hairs; the lamina and its margins covered with purplish or reddish-purple hairs; lateral margins at lamina (which is yellowish-green) strongly fringed (or combed); combings pronouncedly pruinose and sparkling like jewels. Column short, broadly winged (but not so widely as in *C. campestris*), a dark purple gland at the base of each wing, convex at the back, fleshy. Anther rather long, incumbent, subobtuse, greenish-yellow. Stigma triangular. Rostellum prominent, no caudicle present.

Victoria: Cravensville, Anglesea, Portland districts.

Flowering: Late October, November, December.

KEY TO FIGURES

Calochilus saprophyticus, Rogers

Figure A—A typical specimen. B, C—Lower portion of two plants, showing underground system. D, E—Lateral sepals from two flowers. F—Hairs from the labellum-lamina. G—Stigma, showing rostellum. H—Column, side view. I—Column, front view. J—Labellum from below. K—Labellum from above.

(For natural size of Figs. A, B, C, see letterpress.)

THE SECTION *GENOPLESIUM* IN THE GENUS *PRASOPHYLLUM* (ORCHIDACEAE)

By the Rev. H. M. R. Rupp, Northbridge, N.S.W.

Part III—Notes and New Records, etc.

P. Ruppii Rogers, var. *menaiense*, var. nov.—*Labellum acuminatum, recurvum; callus breviter ciliatus. Columnae appendicium lobi anteriores longissimi, primo pro stigmate paralleli, postea transversi.*

Labellum acuminate and recurved (in the type oblong-apiculate and almost straight); callus shortly fringed. Anterior lobes of the column-appendages very long, at first lying parallel in front of the stigma but not concealing it, but after fertilisation crossing one another and so protecting the stigma from intruders.

Between Menai and George's River, south of Sydney, E. Nubling, 4/1928. The late Dr. Rogers determined this plant as a form of *P. Ruppii*. To me it seems that the features described above almost warrant independent rank; but in other respects it is perhaps too close for separation. The type form was discovered at Bullahdelah in 1923, and subsequently I found it at Paterson, and at an altitude of about 3,000 ft. on the southern approach to Barrington Tops. I had not seen it south of the Hunter River, but I found in the N.S.W. National Herbarium a specimen from Chatswood collected by H. C. Watt in 1923, which was labelled *P. nigricans*, but is undoubtedly *P. Ruppii*. Then I learned that Mr. Nubling had discovered it close to Watt's locality in 1928, and again, in the form just described, near Menai.

P. trifidum Rupp.—This species was originally described in *Vic. Nat.* LVIII, June, 1941. The description was made, after considerable delay, from two specimens found at Castlecrag, Middle Harbour, Port Jackson, in 1940. In April, 1942, a number of plants came to light about four miles away, and examination proved that the description had been faulty. It had been stated that no segments were gland-tipped. As a matter of fact, in nearly all flowers the petals are conspicuously tipped with a linear, slightly twisted gland. Mr. Nubling found this plant at La Perouse and Middle Harbour long before my own discovery, and he suggested to Dr. Rogers a name descriptive of these flagelliform glands; but I was unaware of this, and of course the name *trifidum*, having been duly published, must stand. It alludes to the column-appendages, which are frequently but not invariably trifid.

P. Beaugleholei Nicholls (in *Vic. Nat.* LIX, May, 1942).—Mr. Nicholls' description should be consulted. About the time of Mr. C. Beauglehole's discovery of this plant near Portland, Victoria, the Misses J. and G. Scrivener, of Mt. Irvine, N.S.W., sent me specimens of a small *Prasophyllum* which at first I believed to be a new species. It seemed very close to, if not identical with, the plant which Fitzgerald (*Austr. Orch.* II, 4) erroneously figured as Stuart's *P. intricatum*. After the publication of *P. Beaugleholei*, I made careful comparisons between this and the Mt. Irvine plant, Fitzgerald's "intricatum," and Hooker's Tasmanian *P. nudum*. I came to the conclusion that these were *all* conspecific; and Mr. Nicholls has since expressed his concurrence in this view. *P. Beaugleholei* has thus a much wider range than was suspected. Priority in the matter of its discovery beyond Tasmania, however, must be awarded to Mr. Nubling, who found specimens at Mt. Wilson in March, 1929. These are precisely identical with the specimens sent by the Misses Scrivener from Mt. Irvine.

P. Morrisii Nicholls (in *Vic. Nat.* XLVIII, Oct., 1931).—This was for many years known in Victoria as *P. Archeri* Hook. When Nicholls demonstrated (l.c.) the identity of Stuart's *P. intricatum* with Hooker's species, he described the pseudo-*Archeri* as a new species under its present name. It was known to occur near Braidwood in this State (coll. Boorman), where it was supposed to represent a mountain form of *P. fimbriatum* R.Br. This determination may have been based on a specimen in the Deane collection at the National Herbarium (Sydney), which was labelled to that effect no doubt on the authority of Fitzgerald; no locality was given. The determination, however, is undoubtedly wrong, and cannot be upheld. *P. Morrisii* is now known to extend much farther north than Braidwood. It is quite likely that Deane's specimen came from the Blue Mountains, and that, like so many other orchids in his collection, it was obtained there by Fitzgerald himself. At all events, it was found in the Blue Mountains by Mr. Nubling, who was unaware of the description of *P. Morrisii*. It was discovered near Mt. Irvine again by Mrs. C. A. Messmer in Jan., 1941, and was sent to me from that locality by the Misses Scrivener in the late summer of 1942. A solitary specimen was found in 1938 by Mr. M. Moodie at Oxford Falls, behind the Narrabean Lakes.

P. Woollsii F.v.M.—No definite record of this species was published, as far as I can ascertain, from Fitzgerald's time until 1939, when in the *Australian Orchid Review* (Dec. and Jan., 1940) Mr. Nubling contributed an account of the orchids of the N.S.W. National Park at Port Hacking, and among them was

P. Woollsii. A specimen of Fitzgerald's in the Deane Collection at the National Herbarium was labelled "Type," but this was obviously an error, for the specimen was collected by Fitzgerald at Lane Cove, while the type was a Blue Mountains plant collected 20 years before by a Miss Atkinson (Mueller, *Fragm.* v, p. 100). In November and December, 1941, Miss G. Scrivener discovered a number of plants of this species near Mt. Irvine. Mr. Nubling states that he has also found it on the Blue Mountains.

P. acuminatum Rogers (in *Trans.Roy.Soc.S.Austr.*, LI, 1927). Discovered by the present writer at Bullahdelah in 1923, this species was later recorded at Paterson, Weston, and Port Macquarie. Critical examination of an unlabelled specimen in the National Herbarium, collected by an unnamed school teacher at Medowie, near Raymond Terrace, in 1910, has proved its identity with *P. acuminatum.*

P. filiforme Fitzg.—A solitary specimen found by Mr. Nubling in February, 1929, on Scott's Creek, along the fall from Chatswood to Middle Harbour, appears to agree with this species so closely that it had better be included in it, at least until further material is available. The only outstanding difference is in the column-appendages, which are much larger and broader than shown by Fitzgerald. The labellum, however, is so similar to Fitzgerald's that identity of species is probable. It may be mentioned here that in March, 1924, the writer collected specimens at Bullahdelah, in a rather advanced stage of flowering, which were suggestive of this rare species. Dr. Rogers expressed the opinion that they were "probably" *P. filiforme.* Quite recently I softened one spike out, and after some difficulty was able to conclude definitely that this determination was correct. Fitzgerald's only locality was Picton.

P. densum Fitzg.—This species has been recorded by Mr. Nubling from Normanhurst, National Park, Bell, Mt. Wilson, Mt. King George, and Mt. Victoria; by the Misses Scrivener from Mt. Irvine (3/1942). A specimen in the National Herbarium collected by the late Adam Forster at Lane Cove, which was erroneously labelled *P. reflexum* Fitzg., belongs to this species. It is by no means always the pale green colour depicted by Fitzgerald, but is often a dark brownish-green. Other variations have been observed, but they are on the whole of minor importance.

P. rufum R.Br.—This species is very difficult to determine, and in this State at all events would appear to be very rare. Specimens collected at Collaroy Beach and Oxford Falls, which I was inclined to regard as *P. rufum*, are considered by Mr. W. H. Nicholls to belong to *P. trifidum*, and after further examination I am inclined to agree; the flowers are almost past maturity, and are not easily recognizable. I am extremely doubtful whether any specimens of Brown's species are in the National Herbarium at Sydney. I understand that Mr. Nicholls is endeavouring to clear up the obscurity now enveloping this species, and it is to be hoped that he will succeed.

P. longisepalum Fitzg.—Mr. Nubling has recorded this rare species from Loftus, near Port Hacking, and Mt. Wilson. His drawings of the floral details leave no room for doubting the correctness of his determination. Loftus, 3/1928; Mt. Wilson, 4/1928 and 4/1931.

P. fuscoviride Reader.—I have received specimens from Lieut.-Col. B. T. Goadby, collected by Mr. Steedman at Lake King, Western Australia. So far as I am aware, this is a new record. The date is uncertain.

It may be considered by some students of these *Genoplesium* Prasophylls that in the descriptions of new species in Part I of this paper I have not been sufficiently careful to record with accuracy the incidence of glands on the tips of various segments of the flowers. My own experience is that this particular feature of terminal glands, which is undoubtedly a characteristic of the section Genoplesium in general, is by no means reliable when applied to individual species. An analogy may be seen in Cunningham's *Caladenia clavigera*, which is frequently found (especially in Victoria) without any sign of "clubs" on the sepals; yet it received its name from this feature. So in the case of these Prasophylls I have called attention to the terminal glands only where it seemed desirable on account of their prominence. It does not follow that in other cases they are never present.

I would also echo the warning which Mr. Nicholls has quoted from the late Professor Ewart, against placing too much reliance on the form of the column-appendages. In some species this is constant in its outline so far as we know; but in others it has proved to be variable, and as a definite specific feature its description should be accepted with a modicum of reserve. *P. trifidum* was so named because in all the type flowers the column-appendages were trifid; but when other colonies were discovered, it was found that this is by no means a constant feature, and so the name is not altogether appropriate.

(Concluded.)

SHOW AT HAWTHORN FOR JUNIOR NATURALISTS

An important step in the formation of junior branches of the Field Naturalists' Club was taken in November and December, with the co-operation of the Hawthorn City Council. A comprehensive exhibition of objects of natural history interest was staged in the hall of the Hawthorn Public Library, and the young people of the district were invited to attend. A book was available in the exhibition room, for children interested in the formation of a junior naturalists' society in Hawthorn to sign their names and addresses.

Arrangements leading to the holding of the exhibition were made by Mr. S. R. Mitchell, who interviewed the Mayor and members of the council, and gained their interest in the project. As a result the large library hall was made available, and the Librarian, Mrs. Carbines (who, incidentally, is a daughter of one of our prominent members of other days, the late Mr. F. Spry) worked unstintingly with club members to make the exhibition a success. Exhibits were provided by many members, but special mention should be made of the untiring assistance given throughout the exhibition by Mr. and Mrs. Freame and Mr. Mitchell.

The opening ceremony was performed on the evening of Monday, November 16, by the Mayor of Hawthorn (Councillor W. C. Porteous), who was supported by the chairman of the Library Committee (Councillor Fowler), other members of the council, and the Town Clerk (Mr. H. A. Smith). The President and Mr. Mitchell spoke on behalf of the club and outlined the proposals for the formation of a junior naturalists' organization in Hawthorn district.

The exhibition remained open for a month, and many hundreds of names and addresses of interested young people were obtained. It is proposed early this year to convene a meeting of those interested, to formally inaugurate a young people's society which shall be closely affiliated with the Field Naturalists' Club of Victoria. It is proposed that this society shall manage its own affairs, and provide for frequent members' nights at which the juniors shall give their own accounts of natural history work. Excursions to nearer points of interest, under adult guidance, will also be a feature. To provide for its continued success, however, it is essential that the members of this Club shall give the young people all the support in their power, especially in the matter of providing talks from time to time and in leading the excursions.

The committee, seeing in this movement the most fruitful source of future membership of the senior club, has pledged the assistance of members in this direction, and volunteers will be called for specific duties as soon as the junior society gets under way.

Upon the success of the club in the Hawthorn district will depend the extension of the plan to other suburban districts; Prahran, Brunswick, Heidelberg, Malvern, and Brighton have already been mentioned as possible spheres for further activity within easy reach of the homes of many of our adult members. P.C.M.

PERSONAL NOTES

Members join in congratulating Mrs. Frank Sides (Miss Dorothy Sarovich) on her recent attainment of the degree of B.Sc.

Mrs. V. H. Miller recently underwent an operation in a Melbourne hospital. Her many friends will be glad to learn that she is making a good recovery.

Mr. Harry Burrell, O.B.E., of Sydney, widely known for his remarkable work on the platypus, was married on December 2, at Randwick, to Mrs. Daisy Ellen Brown, eldest daughter of Mrs. and the late W. J. Mitchell, of Bowen Park, Trangie, N.S.W.

The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the Club was held on Monday, January 11, 1943. The President (Mr. P. Crosbie Morrison) presided, and about 80 members and friends attended.

BEREAVEMENTS

The President announced the deaths of Miss Bertha Keartland, a Club member since 1926, and two relatives of members, namely, Miss M. Ingram (sister to Messrs. J. and W. H. Ingram) and Mrs. J. A. Ross (wife of Mr. J. A. Ross, until recently living at Rochester).

LIVING OFF THE LAND IN VICTORIA

The subject for the evening took the form of a symposium on "Living off the Land in Victoria." It was dealt with under three headings, with the following leaders: (a) Mallee and Plain, Mr. P. F. Morris; (b) Mountain and Sea, Mr. G. N. Hyam; (c) Animal Life, Mr. P. C. Morrison and Mr. A. H. Mattingley.

Summaries of the remarks of Mr. Morris and Mr. Hyam are given elsewhere in this issue.

Mr. Morrison suggested that the introduced rabbit should be first on the list of food animals, and then such native game that is common, e.g., wombats, kangaroos and wallabies, and possums. This last was possibly the commonest article of meat used by the natives. Emus and parrots, among the birds, were good eating. Fish and marine shellfish (with few exceptions), crayfish and yabbies, snakes and lizards, bogong moths, larvae of the wattle goat-moth and of many beetles, grasshoppers, etc., were all eaten by the aborigines.

Mr. Mattingley added to the list flying foxes, water-rats and seals, and stated that the commonest way of cooking possums was to cover with clay and roast them.

Discussion

The following were among the questions answered:—Was the quandong fruit used for food? Ans., Yes, both species. Was sea-celery used for food by the natives? Ans., Yes. Were frogs articles of diet by the natives? Ans., Yes. What gums other than acacia were used for food? Ans., Grass-tree. Is the river cat-fish poisonous? Ans., No. Do fish caught by the use of poison plants being placed in the water retain any of the poison in the flesh? Ans., No; the effect was to stupefy rather than kill. Did the natives eat "blackfellows' bread"? Ans., It is doubtful; possibly they used it as we use chewing gum. Was not the nardoo a staple article of food? Ans., Not in Victoria. Was the plant known as pigface eaten? Ans., Yes, and similar succulent types also.

Mr. A. D. Hardy emphasised that in the early days of Victoria the native foods available only supported a population of about 6,000; and thus at the present time could not be expected to support any great number.

REPORTS OF EXCURSIONS

Excursions were reported on as follows: Ricketts Point, Mr. P. C. Morrison; Ferntree Gully, Mr. A. J. Swaby.

ELECTION OF MEMBERS

The following were elected: As Country Member, Mr. F. J. Ludowici; as Associate, Miss Eileen Griffin.

NATURE NOTES

Mr. Ivo Hammett stated that black cockatoos were eating pine-seeds and doing other damage at pine plantations.

Mr. V. H. Miller had reported seeing a blue wren catching the cabbage white butterfly.

Mr. A. A. Brunton reported that the American squirrel was a pest in England, and was forcing the native squirrel out of its natural haunts.

EXHIBITS

Mrs. M. E. Freame—Megalopa stage of shore crab, and Pedicellaria of sea-urchin.

Master Leslie Woolcock—A series of butterflies.

Mr. F. H. Salau—*Ficus stipulata*, bearing fruit.

Mr. C. J. Gabriel—Land shells from Queensland (*Hedleyella falconeri*, Reeve; and *Tersites bipartita*, Ferussac).

Mr. C. French—*Prostanthera lasianthos* (Victorian Christmas bush) with pink flowers, collected by Mr. P. C. Cole at Healesville (rare variety); also specimens of the twiggy heath-myrtle (*Baeckea virgata*) garden-grown, and specimens of the banksia borer (*Cyria imperialis*).

SOME VEGETABLE FOODS OF THE WIMMERA AND MALLEE

By P. F. Morris, National Herbarium, Melbourne

At no stage of his existence did the Victorian native show any realization of horticultural or agricultural practices. Surely he must have learned that parts of the many perennial plants which he collected, such as the "Yam," may sprout and grow again when replaced in the ground.

Our aborigines were perfect athletes, built for speed and endurance. They were well fitted physically and mentally to travel with the seasons and conditions of vegetative growth. They often travelled great distances to other tribes in traffic or barter for red-ochre, sandstone and other grinding stones, and seed exchange. The natives found it quicker to travel to more bountiful areas than to wait for crops to mature.

They were greatly handicapped by Nature in the native animals at their command. They certainly could not harness the kangaroo to a plough or use the flesh-loving dingo to drive home the ducks or wallabies. Tribal increase was regulated according to the area of land and food supply offering. They were therefore dependent for food on whatever they could find readily at hand, and they were probably always omnivorous. In the arid inland the chief foods, however, were vegetable, principally the fruits, seed and roots which were within easy reach of prehensile hands.

Under more favorable circumstances, the native flora offered a wide selection of edible, though in many cases not very palatable, roots, tubers, berries, fruits, seeds, greens and gums. Fish, flesh, wild-fowl, crayfish, yabbies, eggs, grubs and honey were plentiful. In these days of rationing and taxation it is apparent that the selection for a diet chart was well in favour of the natives. By hereditary instinct, trial and error, and expert training from their creche days, they understood the nature of every vegetable product in their district and knew what to eat and what to avoid.

Water.—Like the steam engine, man requires pure water, and if supplies are not at hand, both will soon disappear. In dry areas white men have died of thirst where the natives have waxed fat. In such inhospitable places, Nature, as if to make amends for the scarcity of water, provided a perennial supply in the roots of several trees. Many explorers, including Major Mitchell, record the methods by which water—"beautifully clear, cool and free from unpleasant taste or smell"—was obtained. The roots were dug from the ground, cut into foot billets and sucked as in the act of smoking, or allowed to drain into skin water-bags. The roots of the following were chiefly used: *Eucalyptus gracilis* (White

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Mallee), *E. oleosa* (Oil Mallee), *E. uncinata* (Hooked Mallee), *E. polybractea* (Blue Mallee), and *E. viridis* (Green Mallee); also *Hakea leucoptera*, the Needle Hakea.

The Aborigines
"Victoria"
R. Brough
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Beverages and Sugar.—With water the natives frequently compounded liquors from several flowers and honey and gums. This sweetened water was named "Beal" by the natives of Western Victoria and was much relished. The flowers of *Hakea, Banksia ornata,* and *Xanthorrhoea* were used for the purpose.

Starch Supplies.—After water, starch and its component parts are the most important food materials for life. The aboriginal found these in the grains of grasses, underground roots, tubers and bulbs. As starch is so highly represented in grass grains, naturally first place was given to the breadstuffs, and with them were used the closely related seeds of sedges (*Cyperaceae*) and rushes (*Juncaceae*). The grains were ground into oatmeal and flour and cooked with honey and water upon hot stones—the flour often being used as a batter for grubs.

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(1) *Grain-bearers* (*Gramineae*).—Grasses used were *Echinochloa Crus-galli* (Barnyard Millet), *Panicum decompositum* (Umbrella or Native Millet), *P. prolutum* (Pallid Panic Grass), *P. effusum* (Hairy Panic Grass), *P. acroanthum* (Black-seeded Panic Grass), *Eriochloa punctata* (Plains Grass), *Setaria glauca* (Pale Pigeon Grass), and *Paspalidium gracile* (Graceful Panic Grass). The seed of species of *Scirpus, Cyperus* and *Juncus* helped to fill the granary. These native grains give practically the same food analysis as the wheat grain of commerce.

(2) *Seeds and Fruits.*—The seeds of the following were saved and ground into flour:

Polygonaceae—Muehlenbeckia Cunninghami (Tangled Lignum) and *M. diclina* (Slender Lignum).

Chenopodiaceae—Atriplex stipitatum (Kidney Saltbush), *A. angulatum* (Angular Saltbush), *Chenopodium nitrariaceum* (Branching Goosefoot), *C. atriplicinum* (Purple Goosefoot), *Salsola Kali* (Prickly Saltwort), *Enchylaena tomentosa*. Some native species of *Chenopodiaceae* have anthelminthic properties.

Amaranthaceae—Alternanthera nodiflora (Joyweed), *Amaranthus macrocarpus* (Desert Amaranth).

Smyth
p. 213

Aizoaceae—Mesembryanthemum aequilaterale (Pig's Faces, Karkalla or Berudur). The fleshy fruit was eaten by the aborigines and the leaves were eaten baked. During the "Karkalla" season, which lasts from January to the end of summer, the natives led comparatively easy lives.

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Portulacaceae—Portulaca oleracea (Pigweed, Thukouro, or Purslane). Baron von Mueller, in his "Report of the North Australian Expedition," states: "We had almost daily occasion to praise the value of the Purslane. The absence of other anti-scorbutic herbs in the north and the facility with which it can be gathered entitle it to particular notice." The seeds were largely used by the natives during the dry summer months. One would suppose that so small a seed would scarcely repay the labour of collecting. The plants were piled in stacks and constantly turned and the seed later collected from the ground and ground into flour. The same method was applied to grasses, which were cut or pulled and allowed to dry in cocks to shatter the grain.

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Cruciferae—Several cruciferous plants are recorded as being used for greens, but few of the seeds were used on account of their pungent taste. *Roripa islandica* (Yellow Swamp Cress) was eagerly sought. It has medicinal virtues in digestive troubles.

The seeds of *Acacia aneura* (Mulga) were soaked for some days before being cooked. The stem and leaf "galls" are said to be very welcome to thirsty travellers. It is supposed that the seed of other species of *Acacia* were used as food.

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Roots and Tubers—*Microseris scapigera* (Murnong or Daisy Yam). This plant has a small tuberous root rich in starch and a form of sugar and was very plentiful in grass land. It was eaten raw; when roasted it has a very pleasant taste, not unlike the sweet potato. At a very early stage the children were taught to use the "yam stick" for gathering the root. Buckley, the "Wild White Man," mentions the plant as one of the commonest eaten.

Orchids, etc.—Tubers of various terrestrial orchids, principally the flowering species, were collected by aid of the "yam stick." Among them were *Pterostylis rufa*, *P. cycnocephala*, *P. mutica*, *P. concinna*, *Caladenia Patersoni* and *P. dilatata*; the swollen roots of various liliaceous plants, such as the Fringe Lilies (*Thysanotus Patersoni*, *T. dichotomus*, and *T. tuberosus*) and *Anguillaria dioica* (the Early Nancy). In the Amaryllidaceae we have records of the edible qualities of the large bulbous-rooted *Crinum flaccidum* (Murray Lily) and *Hypoxis glabella*. Crinum flour was used commercially by early settlers in times of scarcity. The natives of the Lake Hattah area cooked and made flour of the seeds and roots of *Calostemma purpureum* (Garland Lily). *Scirpus maritimus* (Marsh Club-rush) and *Geranium pilosum* supplied small tuberous roots rich in starch, and they were great favorites when roasted. The young shoots of *Typha angustifolia* (Bulrush or Cumbungi) are edible and resemble asparagus; the fleshy root is excellent—containing 12·5 parts of starch to 73 parts of water and a smaller percentage of a saccharin-like material. The pollen is also used as a food, being made into cakes; it contains 18·3 per cent. of sugar, 2 per cent. of starch and 2·5 per cent. of

Smyth pp. 212, 213

Smyth p.21

magnesium and potassium phosphates. The starchy underground roots of *Phragmites communis* (Common Reed) were dried and ground into flour.

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Gums and Piths.—*Xanthorrhoea* species (Grass-trees, Blackboys or Yacca). Two species, *X. minor* and *X. australis*, are native to the region. The bases of the inner leaves were either eaten raw or roasted. They have a pleasant nutty flavour, slightly balsamic. The centre of the stem contains about 5% of sugar. According to Ligar, about 20 gallons of saccharine juice may be obtained to the ton of the stems. On distillation, this quantity of raw juice yielded 4 gallons of proof spirit. In the year 1876 an application was made at the Patent Office, Melbourne, for a patent for making sugar from *X. hastilis*. *Callitris* species (Murray Pines) and *Xanthorrhoea minor*, *X. australis*, were used medicinally. The saccharine exudation or manna from *Myoporum platycarpum* (Sugarwood or False Sandalwood) was eagerly sought after and eaten. It has been tried commercially as a cane sugar substitute in diabetes. The fleshy pericarp of the *Fusanus acuminatus* (Quandong, Native Peach) has a pleasant sub-acid taste; the spherical kernel is also edible, being very palatable.

nyth p. 213

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Greens.—*Atriplex nummularium* (Old Man Saltbush) and other northern species of *Chenopodium*, *Rhagodia*, *Amaranthus*, *Portulacca oleracea* (Purslane). The food value of the seed and the anti-scorbutic properties of this succulent plant are already mentioned. Species of *Claytonia* and *Calandrinia* have been put to similar uses. *Roripa islandica* (Yellow Swamp Cress), species of *Cardamine*, *Geococcus*, *Blennodia* and *Lepidium* are excellent substitutes for mustard. *Trigonella suavissima* (Sweet Fenugreek). "The perfume of this herb," says Major Mitchell, "its freshness and flavour, induced me to try it as a vegetable and we found it delicious and tender as spinach."

myth p. 213

NO NATIVE FRUITS are mentioned (e.g. Kangaroo Apple, Native Cherry, Raspberry

THE PROBLEM OF "ANTING"

Notes have appeared in the *Victorian Naturalist* from time to time regarding the riddle of "anting"—the practice on the part of certain birds of picking up living ants and rubbing them under the wings. Apparently the purpose is to benefit by the formic acid, but what precise office this serves—whether to rout parasites or to serve as a skin tonic—has not been determined.

Readers are invited to bear this subject in mind during February and March, since this is the period when "anting" has been observed to the greatest extent. Combined observations may throw light on the problem. Starlings, in particular, should be watched. If anyone cares to experiment, it may be well to note that lemon-peel, vinegar (on lettuce leaves), tobacco juice and other astringents have been used by birds at times instead of formic acid.—A.H.C.

LIVING OFF THE LAND IN VICTORIA

By G. N. Hyam, Melbourne

Before the present war, the study of native food plants and animal food was only of interest to anthropologists in relation to the investigation of the culture of the race which used them. From such studies, the reasons for the presence or absence of any forms of agriculture; the distribution of population; their implements and utensils, were explained. The possibilities of Australian plants being brought under cultivation, improved and added to European dietary had no doubt been tested by the early settlers with negative results, and there seemed to be no native plant that would compare with the ordinary cultivated European table vegetables in succulence, palatability, and ease of cultivation. Normally, it is essential that the foodstuffs of modern man in his crowded settlements shall be capable of large-scale production under more or less intense cultivation, as he has neither the skill nor the time to collect his requirements from uncultivated plants, however desirable, in a manner practised by primitive races like our aborigines.

The remotest possibility of any white race having to live on collected rather than cultivated plants and wild indigenous animals seemed to be out of all question. It is true that some modern explorers—notably Amundsen and Stefansson—studied this aspect and developed a technique which enabled them to considerably reduce their impedimenta on exploring trips. During his anthropological investigations in Arnhem Land, Donald Thomson also lived on native food over long periods, but such a necessity did not occur, even to our military authorities, until the present crisis. In the past many explorers and travellers perished through the lack of such knowledge.

There have been many reports from Malaya, Java, Timor and New Guinea of how members of the fighting forces have escaped capture and have engaged in guerilla warfare by taking to the bush or jungle, maintaining themselves by feeding upon indigenous plants and animals, but they often tell of illness or discomfort through eating some deleterious plant product which might have been avoided had they been acquainted with native food-lore, and they probably missed plants of far greater food value for the same reason.

The necessity of knowing something about the food value of our native plants and their preparation for consumption has now been recognised by the authorities in connection with commando and guerilla training, and they are being studied to that end. Taking a far-sighted view and as a matter of security during a possible grave emergency, this phase of food supply might be carefully studied by the civilian, who might conceivably be, at least temporarily, cut off from normal food supplies, a condition which has frequently occurred in occupied countries. Even in England, the hedgerows and woods are being combed for substitute vegetable foods rich in vitamins to supplement the cultivated varieties. There, they are utilising the "hips" of the dog rose (*Rosa canis*) and the sweet briar (*R. rubiginosa*) for their vitamin content, in addition to some of the herbs which in the remote past were used by our ancestors but which had not been used for generations on account of the introduction of choicer cultivated vegetables.

It is known that the aborigines of Australia were able to maintain health and had a reasonably balanced diet from the plants they were able to collect (see "Vegetable Foods of the Aboriginal," *Vic. Nat.*, vol. LVI, pp. 95-98 and 115-119, and "Animal Foods," vol. LVII, pp. 119-124 and 136-139) and a knowledge of their technique of collection, hunting and cookery, as well as their known food plants, would be invaluable in the case of emergency. This is qualified by the facts that the aboriginal had the whole day at his disposal to collect his daily requirements, an unlimited range of country, a sparse population, and a far greater abundance of native plants. Against these factors, a larger number of species might be used as we understand cooking by boiling and steaming, which he did not. A large number of alien plants have also been introduced since settlement which could be used as food and which are reasonably palatable and healthy. Widespread plants such as the Nettle, Dandelion, Orache, many of the Brassicas and the Chenopods, some of the thistles, watercress and many others, are examples of alien plants which are edible and antiscorbutic. Escaped garden varieties are not infrequently found even in remote places. Some of the cultivated fodder plants, such as lucerne, are actually being used for human consumption; even the young shoots of some of the grasses are also being tried with promising results.

In the closer settled States, such as Victoria, there would also be a fair chance of collecting grains and roots from sown or self-sown crops, and it can be assumed that roving domestic animals, hares and rabbits would provide a meat supply additional to our scanty native fauna.

The question of the maintenance of health under refugee or guerilla conditions is therefore largely the ability to identify edible plants and to be acquainted with their likely habitats. Some knowledge of their mineral and vitamin content is also desirable, so that the best selection can be made from available supplies. Drought conditions would increase difficulties, but a study of aboriginal methods under such conditions would at least provide for the barest necessities of food and water. The collection of dried grass-seeds and plants found around swamps and water holes would all contribute, as well as methods of finding water itself.

At the outset, it would probably be difficult to overcome our aesthetic inhibitions in regard to food, but hunger would no doubt help in that regard. The aboriginal methods of cooking, with the addition of our methods of boiling and steaming, probably allows the maximum nutrition and palatability to be obtained from wild food. These methods should also be studied by those who might find themselves under the necessity of living off the country. In any case, might it not be considered a minor contribution to the war effort for naturalists and others to give some time and thought as to the best methods of maintaining life in the event of grave emergency, and to be in the position to act as advisers, if occasion arose?

A matter of interest to naturalists is what is going to be the effect on our fauna if such conditions arise. Any experiments and training in living off the country should be watched to see that there is no undue slaughter of any species which may be found to be specially edible, and that in such cases their use should be confined to emergency periods only. Many of our birds were brought almost to extinction in the early days of settlement because they were found to be choice subjects for the table.

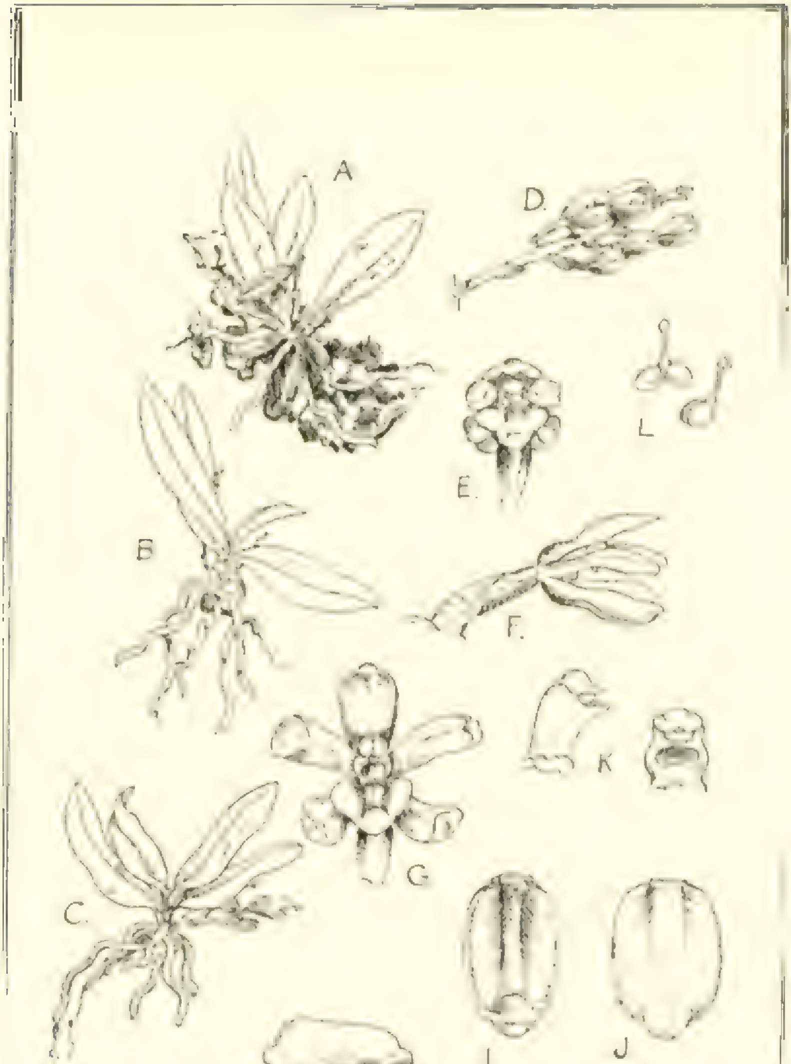
A NEW GENUS OF AUSTRALIAN ORCHIDS

By W. H. NICHOLLS, Melbourne

DRYMOANTHUS. Gen. Nov. (From *Drymos*, a forest, and *anthos*, a flower; alluding to the habitat of the species.)

Sepala ac petala sub-æqualia, patentia. Labellum crassum basi sessile, concavum, sine calcare basali, marginibus integris discus sine callis vel glandibus. Columna brevis, lobis duobus ante prolatione basali carente. Anthera operculata: pollinia 4 paribus duobus: caudicula elongata. Herbæ epiphyticæ. Caules breves. Folia oblongo-elliptica. Racemi axillares. Capsulæ anguste-oblongae. Cognatus cum Sarcochilus, R. Br.

Sepals and petals nearly equal, spreading. Labellum fleshy, sessile at the base of column, concave; without any spur at its base; margins entire, no callosities or glands on disk. Column short, with 2 lobes or teeth in front, no basal extension. Anther lid-like. Pollen-masses 4, in 2 pairs, caudicle slender, attenuated. Epiphytal herbs, at present represented by a single species. Stems short. Leaves oblong-elliptic. Racemes axillary. Capsules narrow-oblong. Allied to *Sarcochilus*, R. Br., but separated by a number of important features; among these are the following—an *entire*



Drymoanthus minutus, Nicholls.
For Key, see opposite page.

labellum, which is *sessile* at the *immediate base* of column; absence of any callosities or glands on the labellum disk.

DRYMOANTHUS MINUTUS, sp. nov. (The specific name is in reference to the diminutive character of the plant.)

Planta pusilla epiphytica. Caulis brevissimus circa 1 cm. longus. Folia oblongo-elliptica circa 4-5 cm. longa. Racemi breviores quam folia. Flores parvissimi sub-virides; sepala ac petala patentia lineari-spathulata falcata concava obtusa. Labellum crassum album obovatum; marginibus integris, marsupium basale carens; latus ac longitudinalis canalis transit laminam; laminæ pars anterior pubescens alba, lobus medius pæne obsoletus; laminæ marginem infra anteriorem tumor fere globosus. Columna brevis sine prolatione basali. Florens Decembri; flores suaveolentes.

A diminutive plant epiphyte. Stem very short, about 1 cm. long. Leaves oblong-elliptic, about 4-5 cm. long. Racemes shorter than leaves. Flowers very small, greenish, labellum white. Sepals and petals spreading, linear-spathulate falcate concave obtuse, margins entire, no basal pouch. Labellum-lamina traversed by a wide longitudinal channel; anterior part pubescent, mid-lobe almost obsolete; below anterior margin of lamina is an almost globular eminence. Column short, no basal extension. Flowering December, flowers fragrant. Habitat: Queensland (North), Mt. Fox (via Ingham).

The solitary cultivated plant from which the foregoing descriptions were made was in the author's possession for more than two years. When received, four capsules were attached to the peduncles (2) of the preceding season. Late in December of the following year (1935) one raceme of flowers was produced. (I have depicted the plant in three stages.) The specimen now reposes in the author's herbarium. It constitutes the type of the new genus, and is allied to *Sarcochilus*, R. Br.

Mr. A. Glindeman, of Brisbane, is the discoverer of this diminutive, yet most interesting orchid. To this collector, who is well known among orchid-students, I am indebted for much rare orchidaceous material from places difficult of access. In a recent letter he writes in reference to the new plant: "I have seen a number of specimens of this small species, but unfortunately the habitat is in almost inaccessible country, and an opportunity for a visit has not again presented itself."

KEY TO PLATE

Drymoanthus minutus, sp. nov. Figure A—Plant, with capsules. Figs. B and C—Typical specimens, about natural size. Fig. D—Raceme of flowers. Fig. E—Flower expanding its segments. Fig. F—Flower from side. Fig. G—Flower from front. Fig. H—Labellum from side. Fig. I—Labellum from above. Fig. J—Labellum from below. Fig. K—Column, from side and front (the frontal view shows the column with pollinia removed). Fig. L—Pollinia.

STATISTICAL NOTES ON THE MALLEE FLORA

By JAMES H. WILLIS, National Herbarium of Victoria

In 1937 appeared Forest Inspector W. J. Zimmer's "Flora of the Far North-west of Victoria", it was the consummation of nearly ten years' research over a wide area, a masterly brochure co-relating Mallee plant covers with their underlying soil types and emphasizing their great importance in the prevention of wind erosion (see review in this journal, vol. LV (1938), pp. 36 and 147). Mr. Zimmer confined his attention to the country lying north of an east-west line from Hattah Lakes to the South Australian border (i.e., about fifty miles south of Mildura)—a wise decision, since the high sandhills of stunted Mallee eucalypts and Porcupine Grass near Hattah mark the absolute limit of numerous shrubs which are a feature of Mallee districts farther south, e.g., *Casuarina Muelleriana, Grevillea ilicifolia, Hakea flexilis, Gyrostemon australasicus, Billardiera cymosa, Acacia spinescens, Daviesia ulicina, Aotus villosa, Eriostemon gracilis, Phebalium bullatum, Bredemeyera scoparium, Cryptandra amara, C. propinqua, Hibbertia virgata, Baeckea Behrii, Loudonia Behrii,* and *Anthocercis myosotidea* all stop here, while many other species (notably of *Chenopodiaceae*) occur only to the north of the line.

In three short visits (May, August and September) to this "Far North-west" sector I have seized every opportunity to botanize over as much country as possible, with the result that Mr. Zimmer's list has been appreciably augmented, chiefly through the addition of small seasonal plants (*Ophioglossum, Geococcus, Alyssum, Hydrocotyle, Toxanthus, Chthonocephalus,* etc.) and several aquatics which could easily have been overlooked. During a four-day camp at Lake Little Hattah, in September of 1941, the surrounding Kulkyne National Forest of some 121,500 acres was combed in several directions, and I was able to bring the Zimmer list up to *490* species of indigenous vascular plants.

Recently a 20-page article by J. G. Wood, M.Sc., of the Botany Department, University of Adelaide, has come to my notice; it is reprinted from *Transactions of the Royal Society of South Australia,*" 1929, and is entitled "Floristics and Ecology of the Mallee." The writer states at the outset that his paper "is the result of a study of the Mallee scrub, extending over six years, and includes observations made in the Murray Mallee (South Australia) . . . and also in the Millewa and Wimmera districts of Victoria." Appended is a list of species, "as complete as is possible at the present juncture." Wood divides the great Mallee belt of South Australia, Victoria and New South Wales into three territorial elements—Eyre Peninsula, Yorke Peninsula, and the Murray Mallee, which covers by far the largest area, extending hundreds of miles from the Flinders Range south-easterly to the Coorong coast and along the Murray River to near Echuca in Victoria.

The total number of species recorded for the Murray Mallee is *490*—exactly the same figure as cited above for our Far North-west! This apparently remarkable coincidence led me to closely compare the individual names of our Victorian list with those on Mr. Wood's list, in the expectation of a very homogeneous flora throughout the Murray Mallee region.

The outcome was surprising indeed: no fewer than 200 of our 490 N.W. Victorian representatives are not mentioned at all by Wood! Their place is taken by 40 Composites, 20 Legumes (mostly Acacias), considerable numbers of *Myrtaceae*, *Rutaceæ*, *Orchidaceæ*, and a dozen naturalized aliens. It seems incredible that such typical and (in Victoria) widespread Mallee plants as *Amphipogon strictus*, *Schoenus aphyllus*, *Lepidosperma viscidum*, *Gahnia lanigera*, *Lomandra leucocephala*, *Tricoryne elatior*, *Trichinium obovatum*, *Acacia ligulata*, *A. homalophylla*, *Nitraria Schoberi*, *Eucalyptus viridis*, *Prostanthera chlorantha*, *Olearia rudis*, *Helipterum Cotula*, *Helichrysum bracteatum*, etc., etc., should be entirely lacking from similar dry country west of the South Australian border or that the most casual observer should fail to see some of them while passing through Millewa district.

Thirty-four species of *Gramineae*, 15 of *Cyperaceae* and 17 of *Chenopodiaceae* (including all species of the "glasswort" genera, *Salicornia*, *Pachycornia* and *Arthrocnemum*) do not appear in Mr. Wood's catalogue for the Murray Mallee; neither does he mention a single water plant, nor explain why the aquatic community has been excluded from his treatise—at least 77 species, half being monocotyledons, grow only on the Murray banks or upon low land subject to inundation (e.g., *Eucalyptus camaldulensis*, *E. bicolor*, the rare *Crinum flaccidum* and *Calostemma purpureum*). Even when disregarding all inhabitants of the Murray flood plain, the list of species as drawn up by Mr. Wood could be enriched to the extent of more than 120 characteristically Mallee plants.

FITZGERALD'S NAME

Mrs. Messmer's note in the January *Naturalist* is very interesting. One must, of course, give due respect to the great orchidologist's son—if a man does not know his own name, who does? But there are one or two pertinent questions. *Australian Orchids* was published under the author's direct personal supervision. Why, then, does his name consistently appear throughout that publication as *Fitzgerald*, with the "*g*" small? If a mistake was made in the first part, why did he never correct it? And why did his intimate friend Henry Deane perpetuate the error in the latter part of the work edited by him after the author's death? I confess that to me it savours a little of pedantry that now, fifty years after Fitzgerald's death, an attempt should be made to alter the generally-accepted spelling of the name, particularly when the evidence is so strong that the owner of the name and his associates themselves accepted it. H. M. R. RUPP (Sydney).

TALES TOLD IN CLUB

By CHARLES FRENCH, Retired Government Biologist, Melbourne

[Mr. Charles French, one of the oldest members of the Victorian Field Naturalists' Club, has a fund of amusing and instructive stories relating to the early days of the Club, and he has been persuaded to set some of them down—being assured, of course, that anything he may say will not be used in evidence against him! Here is a first selection of Mr. French's tales.—Editor.]

MR. HILL'S FAMILY

In the old days of the Field Naturalists' Club it was the custom to give prizes to the junior members for the best collections of entomological specimens. One of the early members was Mr. G. Hill, a keen and capable naturalist. Mr. Hill's three sons also were very enthusiastic naturalists and won most of the prizes. One evening Baron von Mueller was presenting the prizes and the first to come along was one of the three Hill boys. The Baron congratulated him. Along came another of the sons, and he, too, was congratulated. Then the third boy arrived and also received congratulations. Later on they had each to receive a further prize. The Baron, whose sight at night was not good, failed to recognize the same boys and again congratulated the three. Then he turned to Mr. Hill and said, "I must congratulate you on your family of six clever boys!" Mr. Hill looked embarrassed for a while, but I am sure he enjoyed the joke.

THE BARON AND THE SAVELOY CART

Baron von Mueller always attended the Field Naturalists' Wild Flower Shows and meetings, and named the plants for the exhibitors. One night he was at the Royal Society's Hall, where some of the earlier shows were held. It was a dreadful night, with a howling wind and rain in torrents. About 9.30 the Baron said, "Sharley [Charley], we will go home by a cab." Off we started from the room, and when we reached the front gate the Baron noticed two bright lights in a cart coming along the road towards us. The Baron thought it was a cab and promptly called out, "Hey there, hey there! Are you engaged?" The man in the cart came over and said, "How many, Boss?" The Baron said "Two" (meaning himself and myself). The fellow got off his cart and I had a lot of explaining to do—to point out it was all a mistake. The man was much annoyed and drove off in a rage in the pouring rain. The Baron turned to me and said, "Sharley, that fellow seems in a temper!" I replied, "Yes, Baron, he certainly was annoyed at having had to stop and get down from his cart in the rain." The Baron asked, "What sort of a conveyance was it?" I said "A saveloy cart, and, when you said 'Two,' the man thought you wanted two saveloys!" The distinguished scientist was a proud man. "My God, Sharley," he cried, "fancy Baron von Mueller going along the street eating saveloys!"

A GEOLOGICAL ODDITY

It was once a custom to have geological excursions to the quarries on the Yarra near the Botanical Gardens. (These quarries were near Brander's Ferry, quite close to the gate leading to the Temple of the Winds.) A certain member of the Club, who was interested in geology, led an excursion to the quarries one Saturday afternoon, in the early days of the Club. This member was not exactly popular with others, as he assumed a lordly manner when airing his knowledge at meetings. When he arrived with his fairly large party he immediately put on an air of great importance and commenced explaining, in highly scientific language, the various stratas and rocks of interest. Presently he saw, in the crevice of a large rock which he had intended pointing out as another interesting geological feature, a clay model of a man, about four feet tall, which had been worked very carefully into the crevice. When our geological friend came suddenly in front of this, he flew into a rage (he was always bad-tempered) and shouted, "I wonder who would stoop so low as to do such a silly thing as that!" Some "fiend" had modelled the "man" as a practical joke. Turning to my father, who was near him, he said, "If this was done by a member of the Club and I find out who did it, I will move to have him expelled from the Club. What do you think about it, Mr. French?" My father replied, "Yes, I fully agree with you." Years after the geologist had passed away, my father "confessed" to having been the joker—but he was *not* expelled from the Club.

THE "NEW" PARROT HOAX

In the old days of the Club, one of its members—a tall, proud man with a large flowing beard and piercing eyes, and wearing a big tie adorned with a large ornament—was greatly interested in parrots. One evening he was reading the description of what he thought was a new parrot sent to him by a correspondent in North Queensland. The sender stated, in a letter to our ornithologist, that the parrot sent was very rare and that there were only a very few of them where he shot the specimen forwarded. Our friend was very enthusiastic and fully described the bird as a new species. He then sat down and seemed quite pleased with himself.

The President asked, "Would any of our ornithological members like to say a word or ask any questions?" One of our leading ornithologists rose and remarked, "I regret to say that Mr. —— has evidently been grossly misled by his correspondent, as the parrot described is a fairly well-known New Guinea species." Everyone present was really sorry. The correspondent who sent the specimen had evidently been deliberately misleading.

I well remember several similar instances of paid collectors sending Baron von Mueller plants said to have been collected in Queensland but which were natives of New Guinea and the adjacent islands. Beetles were frequently sent to try and mislead my father, the collector stating that he found them in North Queensland. These insects were common "jewel beetles" (Buprestids) from India, etc. I am afraid my father's reply to the sender was an unpleasant shock for him.

THE STORY OF URACANTHUS

When on an entomological excursion with a professor and some university students at Black Rock, I was engaged cutting off some of the boughs containing the insects from the coastal wattle and Banksias (native honeysuckles) when a man on the Beach Road called out, "Hey, what are you smashing the trees for?" I replied, "It's all right: I have a permit." Evidently he did not hear what I said, for in about five minutes two constables on bicycles came along at a great rate through the tea-tree. They put their bicycles down hurriedly and one asked, "Well, what do you think you are doing? You know quite well that you have no right to destroy the trees. What are you smashing the limbs for?" As they both became very officious and asked me more questions, I coolly said, "I am looking for *Uracanthus*." (This is a Longicorn beetle destructive to wattles, banksias, etc.) The constables stared. "What's that you said?" one of them asked. I repeated, "I'm looking for *Uracanthus*." They looked at each other and one of them barked again, "What was that you said?" Again I repeated "*Uracanthus*," and this time I added, "It is a beetle which destroys some of our native trees. I have a permit from your Council to collect specimens." I then produced the permit. "Well," growled one, "why didn't you tell us this at first?" Then they left—without making an arrest.

The professor and students (after the departure of the two constables) roared laughing. This happened years ago, but I often meet some of the old students who attended that excursion and they always ask, "Have you been to Black Rock lately for *Uracanthus?*"

E. A. VIDLER, BOOK-MAN AND NATURALIST

Edward Alexander Vidler, who passed away on October 28, 1942, in his 80th year, was not a member of this Club, but was very keenly interested in nature study, especially in later years, and made constant efforts to popularise it. Moreover, from the fact that Mr. Vidler was the grandson of Dr. George Bennett, of Sydney, and that, as a youth living in London, he acted as a link with Dr. Bennett and the veteran Professor Sir Richard Owen, it will be clear that his early career is bound up with the natural history of this country.

He was born in London, and was a son of Thomas Collins Vidler; his mother, whose maiden name was Amelia Gould Bennett, being a god-daughter of John Gould. Educated at a private school in Gravesend, young Vidler, at 17, entered the publishing house of Cassell, where he met many literary celebrities of that period, as well as artists and others. After eight years with Cassell, where he was later on the editorial staff, he came to Melbourne. Here, as well as at Geelong and Warrnambool, he engaged actively in writing and publishing.

It was fortunate that the *Victorian Naturalist,* in past years, secured some contributions from the pen of Mr. Vidler. Vol. XLV, 1928, pp. 74-77, contains his personal reminiscences of occasional visits to Professor Sir Rich Owen in retirement at Sheen Lodge, Richmond Park. In another article he recalls the hasty visit of his grandfather to London, in 1875, when young Vidler conducted Dr. Bennett through Dickens' country near Chatham (*Vict. Nat.*, vol. XLV, pp. 207-8). Mr. Vidler furnished for illustration in the *Naturalist* a unique photograph for Charles Barrett's articles on John Gould, as he stood beside a folio volume of *The Birds of Australia* (*ibid.*, facing p. 42).

Mr. Vidler produced, between 1930 and 1931, four Nature books, well illustrated, entitled *Our Own Trees, Wonder Birds of Australia, Wonder Animals of Australia* and *Our Own Birds of Australia.* Although attractively printed they did not achieve the success they deserved, since at the time there was much competition in similar work of an educational nature. There is also another book, *Native Trees of Australia*, by J. W. Audas, published a few years later, in the initial production of which, I understand, Mr. Vidler had a considerable share.

For many years Mr. Vidler was literary adviser to George Robertson and Co., and in 1914 he produced a text-book on *Australian Fossils*, by the present writer, which is now out of print.

As a sincere nature-lover Mr. Vidler carried his studies of trees and shrubs into the open air, and in 1932 he was appointed, with the present writer, as joint honorary curator of the Maranoa (native) garden adjoining Beckett Park, Balwyn, by the Camberwell Council. One recalls, some years ago, spending a bank holiday with him in mapping out the centre bed for special planting, where originally stood Watson's tool-shed, and which photographers have since acclaimed as to its favourable position. It is inspiriting to the writer, whom Mr. Vidler often referred to as his "Cobber of the Trees," to remember that our families originally came from closely adjoining home-towns in Sussex.

F. CHAPMAN.

The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the Club was held on Monday, February 8, 1943. The President (Mr. P. Crosbie Morrison) presided and about 80 members and friends attended.

LECTURE ON BIRDS

An illustrated lecture on "Birds and the Bush" was given by Mr. C. E. Bryant (editor of the *Emu*). The lecturer, with a fine series of slides showed nesting and other habits of some of our native birds, and with his running commentary, gave an insight into the thrills, perils, and general adventures of a bird photographer. The lecture was greatly enjoyed, and a cordial vote of thanks was carried by acclamation.

ELECTION OF MEMBERS

The following were elected: As Ordinary Members, Miss Margaret Sarovich and Miss Ruth Denny; as Country Member, Miss Nancy Irvine; as Associate Members, Miss Patricia Harris and Master Robert Gwynne.

DAMAGE TO FORESTS

The President stated that the Committee, having received reports that the milling of timber was taking place in Sherbrooke Forest, had immediately moved in protesting to the authorities, and would take the matter up further.

Mr. V. H. Miller and Mr. F. S. Colliver both reported on what was taking place at Sherbrooke.

Mr. A. A. Brunton stated that the effect of taking timber from portion of the Kinglake National Park was that the Lyre-birds left that particular area.

NATURE NOTES

Mr. R. G. Painter reported having located on Mt. Sturgeon a double-flowered form of the Red Correa which propagated itself by underground suckers.

Mr. V. H. Miller reported having seen a large number of possums lying dead on the road to Albury.

Mr. Ivo Hammett stated that a large amount of water was contained in the branches of *Eucalyptus botryoides*.

BIRDS AND THE BUSH

By C. E. Bryant, Melbourne

(Summary of an Illustrated Lecture to the F.N.C. on February 8, 1943)

Bird photography offers sufficient exercise and out-of-doors interest to satisfy anyone, requires patience and ingenuity in the carrying out of subterfuges to deceive the birds, and involves just a dash of danger in scrambling around in the tree-tops.

Swamps have always been a favourite hunting-ground of mine and a number of pictures of water birds have been obtained. With most of the Rallidae, as instanced by the Moorhen, there has been an anticipation of man's invention of stream-lining, such birds having attenuated bodies which enable them to pass quickly through a labyrinth of closely-growing vegetation. Of this type of bird the young are precocial, as distinct from altricial, being able to fend for themselves from soon after hatching. The male Moorhen, however, is usually on hand to take care of the young as they hatch out, and the males of allied water-birds do the same. Often the number of eggs laid by the female Moorhen is extremely large, and the provision of nature in arranging for nidifugous young is, in this case, a distinct advantage, saving over-crowding in the nests.

Grebes—Black-throated and Hoary-headed—have fallen "victim" to my camera. Courtship ceremonies continue after the eggs are well incubated. The dexterity of these species in the water is made most apparent by watching them from a "hide." They will constantly return to and cover the eggs if the concealing material be removed. The eggs are large for the size of the birds, as is the case with practically all precocial birds, the shells are hard, and the vitality of the eggs is superlative.

Reed-Warblers and Grass-birds are musicians of the swamps, the former with rich notes said to be similar to (but better than) those of the Nightingale, the latter a melodist of more solemn harmony. The ability of the Reed-Warbler to draw together reed stems, as the mainstay of the nest, is notable, and the inclusion, in the great majority of Grass-bird nests, of a curled feather of a Swamphen (usually) or Moorhen or Heron, serving as a half-dome, is a custom that may be partly utilitarian and partly ornamental. Black-fronted Dotterels, with their protectively-coloured eggs, their "twinkling" wanderings around lagoon sides, and their characteristic injury-feigning "trances," must be mentioned in any account of swamp birds.

Protective coloration is manifest in birds to a great extent. Eggs that are coloured as is the ground beneath them are noteworthy examples. Consider the Jacky Winter, a brown-grey bird that builds a similarly-coloured nest on a like-hued branch and has young of the same shade. It is safe from observation from above so long as it remains still. Examples could be mentioned in dozens. When the sexes are differently coloured it is the bird that does most of the sitting that is drab in colour. This is usually the hen, but in a few instances where the male does all the sitting he is the plain-coloured member of the pair Where the brightly-coloured bird eschews the brooding he often becomes assiduous in feeding the chicks, which appears to counter-balance, to some extent, the advantage of his staying away during the incubation period.

This aspect of coloration and camouflage and that of mimicry are allied but not the same. Protective colouring is not necessarily designed to match exactly the plumage with the surroundings, for sometimes the protection is based on what is called disruptive, as distinct from obliterative, coloration, the bold patterns, particularly of contrasting black and white, suggesting patches of sunlight and shade.

The best examples of protection are amongst the young birds—speaking generally. That the stippling and spotting is specially designed to protect the newly-hatched young, when they most need protection, is apparent from the alteration in plumage that takes place as the birds reach maturity. Take, for instance, the White-headed Stilt, the Pied Oyster-catcher, etc., whose young make far more marked changes than ever befel the Ugly Duckling. This applies to nearly all ground-nesters whose young are precocious. On the other hand young Crakes, and the chicks of some other swamp birds, are jet black, and do not fit in with the surroundings unless they be considered as suggesting spots of heavy shade in the swamp growths.

More avian interest and variety exists (in Victoria) with Mallee birds than with many others. Centralian conditions come sweeping down to the Mallee and dry inland forms of birds exist with them. Budgerygahs swarm into fence-posts and knot-holes to breed, Cockatiels are common. Parrots and Cockatoos generally abound. The Crested Pigeon is so plentiful that the large numbers that are constantly shot "on the quiet" may not appear to matter: nevertheless the Passenger Pigeon of North America was the commonest gregarious bird the world has seen—and it is extinct. The Superb Blue Wren is a gem indeed, but the Mallee country Black-backed Wren far surpasses him in the scintillating wonder of his plumage. He is a bird of the roadsides, but not the only denizen, for Mallee roads, drawn-out oases amidst deserts of wheat, provide board and lodging for hosts of others—Wood-Swallows (Dusky, Masked and White-browed). Chestnut-tailed Thornbills, White-browed Babblers, Trillers, Hooded Robins and others. Fallow fields nearby produce Banded Plover, Pipits and

Australian Dotterels, with White-fronted Chats, Stubble and Little Quail and Bush-Larks in the grassy fringes.

Of home sites there is no end of variety. Jam tins wired into trees have been taken over by Buff-tailed Thornbills. A kettle jammed in a crotch was used by a Grey Thrush; the spout, turned downwards, appeared as if a part of a drainage system. This point leads us to nest sanitation. With birds in open nests the excreta is often exuded in a small sac. The adults take it away and clean up all traces from the nest. The young themselves may be impelled to project the cloaca over the nest rim in order to "clear" the nest. With some birds that breed in hollows—owls, kingfishers, etc.—the matter is not so simple. A puny Boobook Owl nestling of my acquaintance, far smaller than his brothers, not only received no food, but lay at the bottom of the nest hollow covered with rejected food, pellets and droppings. The stench was overpowering. To this hollow, and to that of nesting Sacred Kingfishers nearby, came dipterous flies that "blew" the refuse, the larvae acting as a sanitary squad and cleaning up the mess in a scatophagous orgy.

Bird photography has produced some interesting, and, indeed, red-letter moments, though not always caught by the camera's magic eye—a Speckled Warbler displaying, with fanned-out tail; to his sitting mate; Grebes courting at a nesting platform; a Little Bittern struggling, unsuccessfully, to hold together its nest in a violent windstorm; a Marsh Crake racing against rising flood-waters to stabilize its nest: a Fantail-Warbler that, tamed by solicitude for its young, allowed me to pick it up and handle it at will; Fairy Terns feeding each other in amorous ecstasy.

And the places wherein the birds dwell—parched Eyre Peninsula with typical desert forms, the alpine regions of Victoria and south-west Tasmania, the flooded maze of the Gwydir Watercourse at Moree, the jungle patches of Queensland's Fraser Island, inlets and bays and swampy river mouths along unfrequented coasts, marshes, mountain-tops, fern-gullies, windswept plains. Birds and the bush, the bush and its birds—a definite correlation and the whole forming a complete picture that should satisfy any naturalist.

(The birds and places mentioned, and others, were illustrated by a number of colour slides).

AN AUSTRALIAN AUSTERITY MEAL

"We were surprised by a large male emu stalking across the plain near our tent. Our dogs, after a chase of 15 minutes, brought him down. At my suggestion our people gathered a quantity of the young leaves of *Rhagodia* (Saltbush), which they boiled and found to be an excellent substitute for a better vegetable, which, with the emu, made us an excellent dinner."—From Allan Cunningham's Diary, May 8, 1817.

"JACK" AND "JILL" OF BADGER CREEK

By DAVID FLEAY, Director, Badger Creek Sanctuary
Healesville

On February 19 this year "Jill," the lively little female Platypus at Badger Creek, completed five years in captivity, being the first Platypus ever to do so. Some days earlier "Jack," her big mate, had in his turn equalled the four years and one month previously established as a world record in 1937 by Mr. Robert Eadie's famous "Splash," so that considerable rejoicing attended the attainment of a double majority by this pair of very distinguished "Duckbills."

Try to imagine the colossal number of earthworms used up over these years, calculated at 800 per animal per night and costing almost a £1 a day in summer months—this not including the countless young yabbies, grubs and tadpoles needed as an essential variation to the diet!

One of the chief results of the successful acclimatization of these two animals and a third ("Rebecca")—which after three years we were forced to liberate owing to war-time economy—is the conclusive evidence that the Platypus may enjoy a lengthy life in captivity and at the same time appear daily before large crowds without affecting its own well-being.

Secondly, it is obvious that the animals must live for a fairly long time. Beyond a darkening of coat-colour neither "Jack" nor "Jill" shows the slightest sign of age. "Barwon," an adult female Platypus captured and acclimatized by the author in 1937, was not under two years of age at that time. Her death at her home in the Melbourne Zoo was not due to old age and it occurred 4 years 10¾ months later, showing that the animal was then at least seven years of age and most probably a good deal more. Considering that a Platypus is not fully grown until aged two years, it seems reasonable to assume that the animals live for at least 10 to 15 years or longer.

Naturally, our success at Badger Creek has been built on the foundation of Harry Burrell's pioneer work and on the wonderful achievement of Robert Eadie with "Splash" (also of Badger Creek)—the first Platypus ever to thrive under captive conditions. A large part of the work of caring for "Jack" and "Jill" has fallen to Mr. C. D. Milne, of the Sanctuary staff, and I wish here to pay tribute to his consistent enthusiasm. Our only disappointment is that so far we have been quite unsuccessful in persuading our female Platypus to lay eggs and rear young ones.

February 19, 1938, was a very hot day and that afternoon two Healesville men met "Jill" (as she was to be known) shuffling down the middle of the Ben Cairn road on the side of Mt.

Toolebewong at Panton's Gap (V.) A furry baby object, able to fit comfortably on one's hand, she had either wandered away from a nesting burrow beside a creek, as baby Platypuses often do, or been carried and dropped by some marauder, possibly a fox, hawk or kookaburra. The nearest stream to the scene of her discovery was at least three-quarters of a mile distant.

"Jill" took kindly to a ready-made home. It was evident that she had been away from a source of food for an appreciable period, for the first two days of her residence at Badger Creek found her out in the water feeding slowly but steadily the whole time. She quickly became an excellent "show" animal, even attempting at times to crawl up my sleeve when worms, grubs and small yabbies were not forthcoming quickly enough.

On one never-to-be forgotten public holiday early in her career a thousand or more people patiently awaited "Jill's" late afternoon public appearance only to have a crestfallen demonstrator explain apologetically, at 3.30 p.m., after a frantic search, that the show was off. Where "Jill" should have been (in her artificial burrow) there was a neat exit hole in the moisture-rotted flooring planks! That night the beam of a spotlight picked her out where she frolicked like a tiny hippopotamus among the tadpoles of a neighbouring lily-pond. She seemed rather glad to return "home," and soon a large and strong new "platypussary" was provided so that her disappearing trick could not be repeated. The new structure—which is the present home of "Jack" and "Jill"—was specially designed to accommodate at least two Duckbills.

The second Platypus to share "Jill's" home was "Rebecca." I caught her one bitterly cold foggy night (1938) in the Boggy Creek, which is little more than a chain of slowly-trickling pools running from Mt. Toolebewong to join Badger Creek in the old aboriginal reserve of Coranderrk. Being fully-grown and obviously a fairly elderly matron, she retained her furtive retiring nature though reconciling herself to the limits of her artificial home. At the time of her liberation in Badger Creek, three years later, she was as much the wild Platypus as on that hectic night when we played wet hide-and-seek in the freezing pool on Boggy Creek.

"Jack," the male Duckbill, who might now be described as an old man Platypus, is a magnificent big animal nearly twice the weight of "Jill." Though not quite as confiding as "Jill," he is nevertheless a tame animal, eager at show periods in the afternoons to accept offerings of beetle larvae by hand.

We first met Jack, then a half-grown youngster, during the great bush fires of January 1939. In the course of a patrol at 2 a.m. one stifling night, he was seen by the light of a torch swimming in a pool in Badger Creek. By means of blocking each

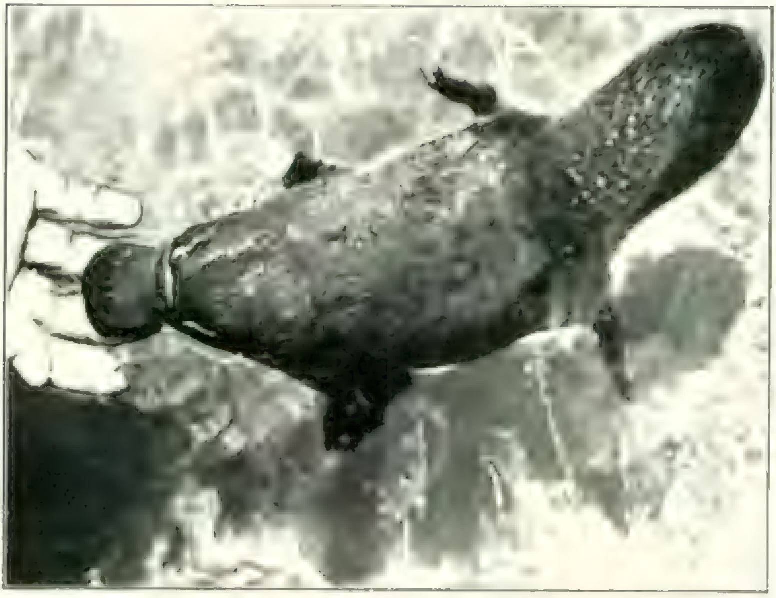
PLATE XI

Early in 1939 two days before the outbreak of the great bush fires H. G. Wells met "Jill"—and incidentally his first Platypus.

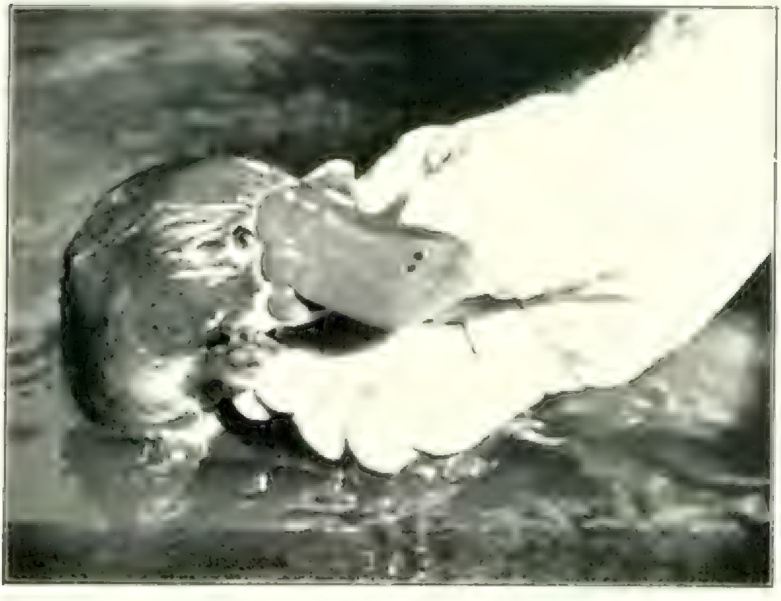
Photos by [illegible] Fleay.

"Jill" is particularly clever at pulling herself out of the water and searching Mr. Fleay's thumb nail for some hidden items of food.

PLATE XII



Bird's eye view of "Jill" floating on the surface, [illegible] tubby being [illegible] with earthworms.



Any grubs about? "Jill" hangs expectantly to the hand that feeds her.

Photos.: S. Alston Pearl.

outlet of the reach with stones, "Jack" was eventually picked up unceremoniously, but safely, by the tail as he swam through the shallows searching for a way out. In the platypussary he settled down quite peacefully with the "ladies," and within ten months had almost doubled his size. In his camping-box the peculiar rank, almost foxy, odour of the adult male Platypus is generally noticeable.

As previously mentioned, the home of "Jack" and "Jill" is a complicated structure provided with a variety of "tunnels," so that the chances of two animals infringing upon one another's dormitories are reduced to a minimum. A Platypus is naturally very wet while in the water but it becomes a miserable creature unless thoroughly dry and furry soon after entering its burrow. Thus the constant changing of moisture-laden grass "bedding" in the wooden tunnels is a highly important task. Incidentally, the entrances to Platypus camping and nesting burrows are situated above normal river and creek level, and not below as popularly supposed. This state of affairs permits the animals to shed a good deal of water and comb and dry their coats before entering their catacombs.

The Platypus, with its manifold idiosyncrasies, needs to be humoured to the greatest extent possible. Even the tamest specimen hates to be handled, and when waking one for a display period it is usually necessary to do so by degrees, allowing the animal to work its own leisurely way through tunnels towards the water.

Even at night, which is its natural excursion-time, a Platypus will sometimes retire precipitately to its burrow should rain begin to fall—not that it could get any wetter but because the drops of water pattering on its highly sensitive bill cause acute discomfort.

So inured is "Jill" to appearances before the public at 3.30 in the afternoons that it is fully three years since such a disturbance has caused her to express a protest in the only voice that a Platypus ever uses—a querulous growl exactly like that of an annoyed broody hen.

Most of us have observed birds of various kinds giving expression to their well-being and joy in life in erratic swooping and tumbling in the air. A healthy tame Platypus does very much the same thing in its watery environment. At night "Jill," who has no fear of lights or human intrusion, rolls, twists and loops in the water, with every evidence of delight in being visited. Another of her performances, rather uncommon for a Platypus, is that of swimming rapidly over the surface of the water.

As a rule a captive Platypus's coat does not long retain its handsome sheen and well-kept appearance unless the animal is able to burrow in soil and retire periodically into a bank of earth resembling the natural bank of a river. In such a bank, provided for the use of "Jack" and "Jill," the animals have excavated a veritable network of burrows. Unwanted exits and cross-passages are closed off or "pugged" up behind the duck-billed tunnellers by means of back pushing with their tails. "Jill" is particularly adept at this type of sealing process, with the result that at times she wears the end of her tail quite bare of its stiff, bristly hair. However, in early January, when a very definite general moult takes place, the growth of a thick new coat of glossy fur and tail bristles quickly hides the worn patches.

[All members of the F.N.C. will no doubt cordially endorse the action of the Committee, which has written Mr. Fleay congratulating him on his striking success with the Platypus—and also tendering felicitations to "Jack" and "Jill."—Editor.]

NOTE ON BUTTERFLIES

At the present time butterflies of the Imperial-blue (*Jalmenus evagoras*) are emerging. These are especially interesting as being one of the species which live in a state of commensalism with ants. The larvae live in small groups, a protective measure which is increased by the presence of hundreds of small black ants. These, or the nearly black pupae, will be found attached to the food plant (Black Wattle and possibly other *Acacia spp.*). They have secured themselves to a little web as in the case of the Imperial White. From a cluster of 9 pupae, brought from Eltham on Sunday, 9 beautiful swift-winged butterflies have already emerged (29/1/43). Enclosed in a large, inverted clock-shade, the base covered with net, they have mated and deposited pale green eggs. These are exquisite, like piles of infinitesimal sea urchins, or the spiny pollen-grains of certain flowers.

When discovered the pupae were smothered in ants which covered the hand that gathered the twig. Having exploited the sweet juices, excreted by the caterpillars, they were still in attendance on the pupae.

These lovely, swift butterflies are not easily seen when on the wing. Inside the glass shade they have made a charming nature study. The wings are of a warm buff below, with black and orange markings. Above, they are a dusky, velvety brown with large central patches of iridescent, silvery-blue. The hind ones have patches of orange near the "swallow-tails." These "tails" move independently of the wings, and are so like the antennae of certain ichneumon flies that they are probably protective.—EDITH COLEMAN.

KOOKABURRAS IN HAYSTACKS

Chatting to Mr. W. Phillips, of Gorae West, through the week (says a writer in the Portland *Observer*) he told me that whilst cutting up a haystack recently they had only cut through one bench (a bench is really a section cut out of the stack) when three white eggs were noticed together. One was put under a hen. (Result not yet reported.) Later a second hole was found leading into the stack, and three more eggs were discovered. Knowing now that they were kookaburras' eggs, the men left them undisturbed, but that night a heavy storm came and lifted the stack skywards and along with it poor Jacky's eggs. The nearest suitable tree was some distance away. I have never heard of the jackass nesting in a haystack before.

ORCHID NOTES FROM PORTLAND

(October-December, 1942)

By W. H. NICHOLLS, Melbourne

(1) *Caladenia arenaria*, FitzGerald.—This attractive spider-orchid has been plentiful in the Portland districts, in South-west Victoria, during October-December. Collectors: Mrs. F. Mellblom and Mr. Clifford Beauglehole. The individual blooms of *arenaria* are not consistently very large, as figured by FitzGerald in *Australian Orchids*, and the colour varies somewhat in the Portland flowers, from the "typical" pale yellowish tone to a beautiful olive-green; this latter is a pleasing tone for a "Spider." The close examination of numerous specimens shows that the characters vary greatly and, for instance, the labella-margins do not always have the neat saw-edge fringe. Indeed, they vary from this to those long calli-combings which are often quite a feature of the larger specimens of *C. Patersonii*, R.Br. Thus, I think FitzGerald's *arenaria* should be considered a variety of it. = *Caladenia Patersonii*, R.Br., variety *arenaria*, n. comb.

With variety *suaveolens*, Nich., the above form hybridises freely: thus intermediates occur, but typical specimens of both varieties are very different, outwardly and "inwardly." Variety *suaveolens* possesses a large stoutly-fringed labellum and the perianth-segments are "heavy," and shorter than those of var. *arenaria*—the filiform tips almost black. Var. *arenaria* is exceedingly "long-legged" but graceful, the labellum correspondingly small. Both forms are fragrant, *suaveolens* being outstanding in this respect.

(2) *Caladenia reticulata*, FitzG., variety *valida* n.var. *Planta robusta ad 30-45*$^{\text{cm.}}$ *alta, Lamina folii ad 15*$^{\text{cm.}}$ *longa et 2·5*$^{\text{cm.}}$ *lata. Flores 2-3, magni, lutei et badii.*

The leaf of this new variety is very large, more so than in sturdy specimens of *C. latifolia*, R.Br. Specimens of this Portland "Spider" often attain a height of 18 inches (45$^{\text{cm.}}$); the stem thick (3-4$^{\text{mm.}}$). Flowers 2-3 usually, pale yellow, with the labellum tip deep red-brown; sepals strongly clavate; labellum more or less strongly reticulate-veined. Flowering September-October. Habitat: Portland. Collectors: Mrs. F. Mellblom and Mr. C. Beauglehole, by whom it is reported as "often in great abundance."

(3) The Hybrid Spider Orchid (*C. Patersonii*, R.Br. × *C. dilatata*, R.Br.). Exceptionally large-flowered and uniquely-coloured—labellum *snow-white* except for the tip which is marked with purplish-red. Locality: Gorae West. Coll.: Mr. C. Beauglehole.

(4) *C. Patersonii*, R.Br. Unusually fine examples with up to 3 flowers; length of lateral sepals 6 inches; petals 4½ inches. Do these measurements constitute a Victorian record for size of flower? Locality: Gorae West. Collector: Mr. C. Ruge.

(5) *Burnettia cuneata*, Lindl. Specimens with as many as *six* flowers. Locality: Gorae West. Coll.: Mr. C. Beauglehole.

(6) *Prasophyllum Hartii*, Rogers. Height of specimens 60-80cm.; plants in myriads. Locality, Gorae West. Collector: Mr. C. Beauglehole.

(7) *Prasophyllum gracile*, Rogers. Height of specimens up to 77cm.; flowers 80-84 in a long extended spike of 10-12 inches (30·5cm.). Locality: Clarence River. Collector: Mr. C. Beauglehole.

(8) *Microtis orbicularis*, Rogers. Height of specimens 24-44cm.; plants very slender, almost wholly red-brown. Locality: Gorae West. Collectors: Messrs. C. Beauglehole and W. Phillips.

(9) *Caladenia pallida*, Lindl. Luxuriant specimens 40-52cm. high; leaf in some plants 25cm. long; all 2-flowered, the flowers bright yellow, tinged with green, tip of labellum dark red-brown. In some specimens the labella presented a new departure, the margins being quite entire and narrowly lined with red, in lieu of the usual combings. In these remarkable flowers, the calli were restricted to 4 only in 2 rows, at the immediate base of the lamina. In Tasmania the sepals of this *Caladenia* are sometimes clavate, but not conspicuously so. This feature is embodied by Lindley in the original description.

NATURAL HISTORY NAMES

To the Editor.

Sir,—Reconstruction is the watchword of to-day. The Victorian Field Naturalists' Club can render a national service in an Australian-wide reconstruction of the vernacular or popular names of all Australian natural history objects.

In a vast number of instances the same species or object is cursed with over a dozen popular names, and in others with none whatever. This leads to endless confusion and is a reflection on Australian naturalists. The popular name is for use by the many, whereas the scientific is for the few and can be left to the scientists to determine. There should be only one popular name for the same natural history object indigenous to Australia. The creation of so many different popular names for the same object has been due to the want of an authoritative name.

In the interests of this refinement might I suggest that the Victorian Field Naturalists' Club approach the various natural history societies of the Commonwealth with the object of establishing an authoritative popular name for all Australian natural history objects?

Yours, etc.,

ARTHUR H. E. MATTINGLEY.

TALES TOLD IN CLUB

By Charles French, Retired Government Biologist, Melbourne.

[Mr. Charles French, one of the oldest members of the Victorian Field Naturalists' Club, has been persuaded to set down some of the many amusing and instructive stories he recalls from the early days of the Club. A selection of these tales was given in the *Naturalist* for February, and here follows the second and (for the time being) last section.—Editor.]

Botanical Excursion to Ringwood

A certain university professor of old, who acknowledged my existence only when he wanted to know where certain plants could be found, had his botany students at Ringwood one afternoon and I happened to meet them. Knowing some of the party, I stopped and had a short talk to them. The Professor, as soon as he saw me, abruptly said, "French, where does *Phylloglossum Drummondi* grow?" (This is the pigmy club-moss, a very interesting and minute plant belonging to the Lycopodiaceae, closely allied to ferns.) Now, I happened to know that about where the lordly professor was standing the plants grew in fair numbers, and on looking on the ground I saw, much to my delight, a considerable patch. "That plant," I said, equally abruptly, "grows at your feet!"

Over many years I recall clearly how annoyed was the professor and how amused were his students. They told me he had been searching for hours for this plant and was unable to find it. Recently I met one of the students (now a chemist) and he said, "Do you remember the Ringwood excursion?" I certainly do!

THE BOTANIST AND THE "PLANT"

A very enthusiastic early member of the Club, Mr. ——, an Italian by birth, who was keenly interested in the native orchids and beetles of Victoria, was on a collecting trip by himself to Sandringham and Black Rock one afternoon, and had a rather exciting time. Just previously there had been a big jewellery robbery in the city and the detectives were told that a man carrying packets had been seen in the tea-tree scrub digging in various places; this was thought to be very suspicious, as the person was probably digging up or "planting" some of the stolen jewellery! Detectives hurried to the locality and came upon the orchid collector.

"What are you digging for?" they asked. Unfortunately for himself, the collector (who spoke very little English and who had a fiery nature) said "I am looking for zee plant." One of the detectives asked in a sharp voice, "What do you know about the plant?" "I dig it up" said the botanist, who had no idea they were referring to the jewel robbery.

The detectives could not make out what he was up to, so they said "You had better come along with us," and he was taken to the police station—at this stage in a fine temper. After a time, however, he calmed down and the detectives were able to understand him and to express their regret at the unfortunate misunderstanding.

The botanist himself often related the story to me during our rambles together collecting natural history specimens.

THE "BUTTERFLY" HOAX

It was on the first campout of the Club—at Olinda Creek near Lilydale—in November, 1884, that the first eggs of the beautiful Helmeted Honeyeater (*Meliphaga cassidix*) were discovered. I happened to be a member of this excursion. Some of the members arrived a day before me and played a joke which I will not forget in a hurry. When I arrived at the camp in the morning, with our late member F. G. A. Barnard, several members were standing together gazing into a eucalyptus tree and one of them said to me "Did you see that lovely butterfly alight on the bough?" Of course I looked up, saw the butterfly, and said to my friends "What a beautiful specimen! I have never seen anything like it before." I am a very poor climber but managed to struggle up the tree to about 30 feet from the ground in an endeavour to capture the specimen. When I made a grab at it my friends saw I was properly "had," and they roared laughing. The "butterfly" was made of thin, coloured tissue paper, and the strong wind made it appear as if quite natural. I returned to earth terribly disgusted, but pretending to enjoy the joke.

CURBING A GLUTTON

A member of the F.N.C., who had a great appetite, came to my office one day and said, "I see the Club has an excursion to the National Herbarium on Saturday next. I know you were once connected with the Herbarium; what do they do there on such an excursion?" I thought it would be a good chance to play a joke on him, knowing he was always on the lookout for a free meal.

I said: "Oh, yes, I know the programme. The members meet at the Herbarium at 3 p.m. The Leaders, Messrs. J. R. Tovey and J. W. Audas, show them collections of very valuable plants, some of them being amongst the first plants ever collected in Australia. This takes till 3.45 p.m. The members are then invited to an afternoon tea where the best of food is served; this includes turkey or fowl, cake, fruit, etc., etc., a really splendid menu. After that they inspect many rare and valuable books on botany and at 5 p.m. they disperse."

About a week later I saw my friend coming towards me, and tried to dodge him, but he saw me and called out. "I say," he said, "you told me they gave a great spread to the Club members at the Herbarium; all they did was to show us a lot of old dried-up plants and some musty books." I looked sympathetic. "What a pity!" I said. "They must have forgotten the spread!"

The same man joined a F.N. Club excursion and campout at the Baw Baws. Each member took enough food to last him for the few days we were there. Every day when we left the hut on top of Mt. Baw Baw our friend would stay behind, and when we returned a lot of our food had disappeared. At last we had very little left and it was impossible to get a further supply so far away from shops. One day, a member of the party, a chemist, said "I'll stop this business!" He opened a tin of sardines and treated them with some chemical. The food-stealer duly fell—after we left again on another outing he ate the sardines. Very soon, then, he became ill and thought he had ptomaine poisoning and was going to die. The chemist fixed him up—after a suitable interval—and we lost no more food on that trip.

A SPIDER NOTE

With reference to the note on a parasite of the Huntsman Spider (*Isopeda immanis*, Jan., 1941), another specimen was brought to me recently by Peter and John Thomson. In this instance one end of the huge parasite had not fully emerged from the body. Spider and parasite had fallen into a vessel of water. Both were dead.—Edith Coleman.

SOME VICTORIAN SPECIES OF *BLECHNUM*

By N. A. WAKEFIELD, A.I.F., Somewhere in Australia

Blechnum procerum (Forst.) Swartz[1] (Synonyms: *Osmunda procera* Forst.; *Stegania procera* and *S. minor* R. Brown;[2] *Lomaria procera* Spreng, Rodway;[3] *Lomaria capensis* (partim) Bentham,[5] Bailey;[6] *Blechnum capense* (partim) Christensen,[7] Ewart[8]).

As can be seen from this synonymy, this and the following species have been somewhat confused. *B. procerum* has a short, thick, but definitely creeping rhizome; robust barren fronds up to 3 ft. high, bearing comparatively few, large (6 to 9 ins. long and 1 to 2 ins. broad), dark green, leathery pinnae. Fertile fronds have a few rather robust pinnae which often show an approach to the state of *eu-Blechnum* in having narrow green laminae outside the long indusia. Illustrated by Labillardiere[1] and Dobbie[4] (pp. 201 and 202), and in the F.N.C.V. book on *Victorian Ferns* (photo. facing p. 21.) Distribution, Queensland, N.S.W., Victoria, South Australia, Tasmania, and from New Zealand to Malaya.

Blechnum capense (L.) Schlecht., (Synonyms: *Osmunda capensis* Linn.; *Lomaria capensis* Willd., and (partim) of Bentham,[5] Bailey[6] and others; *Lomaria procera* var. *paludosa* Rodway;[3] *Blechnum capense* (partim) Ewart.[8]). Rhizome erect (tufted); barren fronds of large forms up to 4 ft. high, bearing very numerous, long (6 to 9 ins.), narrow (½ to ¾ in.), light green, lax, and often undulate, pinnae. Fertile fronds have numerous, narrow pinnae which are definitely Lomarioid in character. The smallest forms of this species have tiny fronds only a few inches high and with as few as six tiny pinnae. Illustrated by Dobbie[4] (pp. 197 and 199), and in *Victorian Ferns* (photo. p. 21). Distribution, same as the above species for Australasia; generally singly or in clumps along exposed banks of creeks and rivers.

Blechnum nudum (Labill.) nov. comb. (Synonyms: *Onoclea nuda* Labill.;[1] *Stegania nuda* and *S. falcata* R. Brown;[2] *Lomaria discolor* Bentham,[5] Bailey,[6] Mueller,[9] Rodway,[3] etc.; *B. discolor* var. *nudum* Christensen;[7] *B. discolor* Ewart,[8] Black[10] and others; not of Forster and Keys.) Differing from *B. discolor* of New Zealand in the broader, shorter and more membranous fronds with more evenly tapering barren pinnae and straighter fertile pinnae without dilated basal lobes. Figured by Bailey[6] and in *Victorian Ferns* (p. 24). Distribution, Queensland, N.S.W., Victoria, Tasmania and South Australia; the "Fishbone Fern" of Australia.

Blechnum filiforme (A. Cunn.) Ett. "A species very remarkable for having two forms of barren fronds; the smaller with sharp-toothed 'leaves' ½ in. by ½ in.; often covering the ground for a considerable area, not accompanied by fertile fronds; . . . festooning lofty tree-trunks with innumerable drooping fronds, and eventually putting forth those bearing 'seeds,' which have the threadlike appearance that suggested the name."[4] Though this species does not appear in the Victorian census of plants, there are two records for this State, based on Melbourne National Herbarium specimens; "Cheltenham Springs, Chas. French," and "Healesville, P. R. H. St. John, Feb., 1905." Possibly it is now extinct in Australia; otherwise it is found in Fiji and New Zealand.

REFERENCES

1. *Plants of New Holland*, by Labillardiere, 1806 (Plates 246, 247).
2. *Prodromus of the Flora of New Holland*, by Robert Brown.
3. *The Tasmanian Flora*, by Leonard Rodway.
4. *New Zealand Ferns*, by H. B. Dobbie.
5. *Flora Australiensis*, by George Bentham (vol. vii).
6. *Lithograms of Queensland Ferns*, by F. M. Bailey.
7. *Index Filicum*, by C. Christensen.
8. *Flora of Victoria*, by A. J. Ewart.
9. *Key to the System of Victorian Plants*, by F. Mueller.
10. *Flora of South Australia*, by J. M. Black (vol. 1).

FURTHER NOTE ON CHARLES GOULD

By F. CHAPMAN, A.L.S., F.G.S., Melbourne

Of the three sons of John Gould, the Birdman, Henry was the eldest. He became a doctor, practised in Bombay and died at the early age of twenty-five. Franklin was the third son; he was born in Hobart and named after Sir John Franklin. He also became a doctor and died young. The second son, Charles, was left behind in England in 1838, when his parents went to Tasmania.

In Alec H. Chisholm's recently published book, *Strange New World*, which is of very great interest to all Australians (and especially to this "new chum" of forty years' standing) we read that Charles Gould, "one of the children left in England in 1838, became a geological wanderer over the face of the earth" and that "he died in South America." In the *Victorian Naturalist*, October, 1939, p. 99, we further read in a note attached to a letter published therein—"Charles Gould to John Gould," by A. H. Chisholm—that "Charles Gould was a geologist who worked in many lands (including Tasmania and New South Wales), and was the author of a book entitled *Mythical Monsters;* he died, unmarried, at Montevideo, in 1893, at the age of about 60 years."

The writer of the present notes, when in England and doing geological work in Kent, had often to refer to the Memoir of the Weald of Kent, by Topley, in which Gould's field notes were included, and so was duly impressed with the name of Charles Gould. For the following facts I am indebted to obituary notice of the Register of the Royal School of Mines, obituary notice on Charles Gould in the Q.J.G.S., and "Systematic Account of the Geology of Tasmania," by R. M. Johnston (Hobart, 1888).

Graduating at the Royal School of Mines in 1856, Charles Gould joined the Geological Survey of Great Britain in the following year. In the Register of the Royal School of Mines of 1896 the entry under Charles Gould shows that he attended the R.S.M. between 1854 and 1856, and passed in mining, metallurgy and geology, gaining the associateship of the Royal School of Mines. Whilst attending the Royal School of Mines, Gould studied under Professor Warington, W. Smyth and gained the Duke of Cornwall's scholarship in 1854, the Royal scholarship in 1856, and the Edward Forbes Medal in the same year: so that here we see successful perpetuation in another branch of science, derived from his illustrious parents.

After a year or two on the English Geological Survey Gould went to Tasmania, where he joined its Survey. His work there lasted from 1861 to about 1874 or 1875. During this time he contributed nineteen papers as separate Government Reports, or as contributions to the Royal Society of Tasmania. His first work was a detailed map of the coal shales deposits of the Mersey district. A full list of Charles Gould's Tasmanian work is given by R. M. Johnston in *The Geology of Tasmania*, 1888.

Charles Gould was elected a Fellow of the Geological Society of London in 1859, and gave two papers on Fossil Crustacea, published in its quarterly journal. He died at Montevideo, Uruguay, on April 15, 1895.*

*Documents in the possession of Gould's relatives give the year as 1895.—A.H.C.

The following exhibits were tabled at the last meeting of the F.N.C.: Mr. S. R. Mitchell.—A series of Palaeolithic and Neolithic stone artefacts. Mr. A. Baker.—A series of mineral specimens from the Cumberland Valley at Lorne. Mr. Ivo Hammett.—A series of garden-grown native flowers. Mr. C. French.—Flowers of *Melaleuca nesophilia* (W. Aust.) garden-grown. Mrs. R. G. Painter.—A series of garden-grown native flowers.

DELETIONS FROM THE VICTORIAN FLORA

By JAMES H. WILLIS, National Herbarium, Melbourne

As experts proceed with the more intensive mapping and monographing of indigenous plant life, it becomes necessary from time to time to correct those errors of the past which have inadvertently crept into our Census. Although they appear in Ewart's *Flora of Victoria* (1930), the following seven records should now be deleted from Victorian lists:

1. *LEPIDOSPERMA EXALTATUM*, R.Br. The National Herbarium has long suspected that this species is conspecific with *L. longitudinale*, Lab.—their types can hardly be distinguished. Mr. S. T. Blake now confirms this opinion, and regards *exaltatum* as no more than a luxuriant condition of *longitudinale*.
2. *LEPIDOSPERMA GLOBOSUM*, Lab. Mr. S. T. Blake relegates all Victorian material so determined to *L. congestum* R.Br.; apparently we have nothing in this State to match Labillardière's figure of *globosum*.
3. *ACACIA CONTINUA*, Benth. Ewart writes, "doubtfully recorded for Victoria . . . Murray River.". Since there is no Victorian specimen extant, and W. J. Zimmer makes no mention of the plant in his comprehensive *Flora of the Far North-west of Victoria*, we would do well to omit it from the Census.
4. *ACACIA ANEURA*, F.v.M. The Mulga is also a very doubtful record and I think Zimmer's statement is conclusive enough—"definitely does not occur in this State; the place nearest to Victoria in which it occurs, in association with Belar, is Oak Tanks, N.S.W., some 18 miles to the north-east of Mildura."
5. *GEIJERA PARVIFLORA*, Lindl. Again, there is not a Victorian collection to substantiate the record, and if Wilga ever did grow this side of the Murray, it has long since been exterminated. Zimmer says, "Considerable search has not revealed its presence in Victoria . . . the nearest locality being about 12 miles north-east of Mildura."
6. *BERTYA ROTUNDIFOLIA*, F.v.M. This is a Kangaroo Island endemic which apparently never did and never will occur in Victoria. Our only record is based on the careless misreading of an old South Australian label, viz., "Queenscliffe to Kinch's," the *Queenscliffe* obviously a local name for a point on the N.E. coast of Kangaroo Island, near Kinch's station, and having nothing to do with Victoria's popular seaside resort.
7. *OLEARIA ERUBESCENS* (Sieb.), Dipp. This seems to be merely a robust form of *O. myrsinoides*—heads, bracts, and vestiture the same, but with longer leaves and panicle branches. I consider that both Mueller and Bentham should be followed in classing it as a variety of *myrsinoides* and not as a distinct species. *O. speciosa*, Hutch. (of the Grampians—see *Bot. Mag.* 8118) is just an evolutionary step further away from *myrsinoides*, but here the more "blankety" tomentum of foliage and branchlets, the coarser bracts and peduncles, as well as the more numerous disc florets, are sufficient to justify our retaining it as a specific entity. Ewart is correct in regarding it as "more closely related to *myrsinoides* than to *O. dentata*" (the latter common in parts of N.S.W.).

It may be observed that the *erubescent* character (particularly on young shoots) extends to several other Daisy-bushes, notably *O. megalophylla*, which appeared in such astonishing profusion over the sub-alpine country between McVeigh's and Matlock the season following 1939's disastrous fire.

ADDLED EGGS AND THUNDERSTORMS

At various times during the past 30 years I have heard of clutches of fowls' eggs being found addled after severe thunderstorms, and have wondered as to the effect being due to electric current or to vibration. In one case, 60 years ago, the eggs in a nest near a chaff-cutting machine were affected at the same time as the lightning "struck" the farmer (who was at the machine) and left him crippled for life.

About a year ago Mrs. V. Tremayne, near Frankston, who had been very successful for years with an incubator, undertook to hatch by its means a setting of 60 pheasants' eggs sent to her from Woodend. The eggs were all right until within a few days of hatching when heavy naval gunfire took place in the Bay. All the chicks died in their shells. Mrs Tremayne states that there was no other attributable cause. The vibration was severe, all the windows in her house rattling violently.

Is there a possibility of the death of wild-bird chicks in the shell being due to violent electrical disturbances, where abandoned nests with eggs have occasionally been found and the cause attributed to a cat?—A. D. Hardy.

"RARE BLOOMS" IN BOMB CRATERS

Under the heading, "London's Bomb Craters May Yield Rare Blooms," the Melbourne *Argus* published the following cable message on February 24:

Botanical experts are hoping that this spring may bring forth from London's bombed soil a flower that has not been seen for 271 years, since the great fire of London. The flower for which they are looking is named "London Rocket"—*Sisymbrium Irio*—which, according to ancient records, grew in abundance in 1666. It is a whitish flower, and the plants are 18 to 24 inches tall. Expectations that it will reappear are based on the fact that already 95 types of flowers and shrubs, many unknown in London for years, are to-day flourishing on the bombed sites.

The "catch" about the foregoing item, as Mr. P. F. Morris (National Herbarium) points out, is that the plant that has "not been seen for 271 years" is a common weed around Melbourne and probably just as common in parts of Britain. It appears mainly on rubbish and ballast heaps. The reason it does not grow in the streets of London, Mr. Morris suggests, is probably because those streets are kept moderately clean. *Sisymbrium Irio* is a relative of the cabbage and formerly was used as a vegetable. Its strong odour caused it to be known as the false garlic-wort.

CONCERNING A RARE PARROT

Has the Ground Parrot (*Geopsittacus occidentalis*) been recorded from New South Wales? In conversation with a friend, Mr. W. Kelly, who spent most of his early life on station properties in southern New South Wales, he informed me that back in the 90's he had on several occasions flushed this parrot on a salt-bush plain, about forty miles from Oxley, between Oxley and Mossgiel on the western side of the Lachlan River. Mr. Kelly's interest in this parrot was aroused by its short, eratic flight and its habit of always settling on the ground. His description suggested the Ground Parrot and on being shown a coloured figure he had no hesitation in identifying it. He further stated that in August, 1897, he found its three white eggs in a slight depression on the ground among what he called "a kind of porcupine grass." Later three young birds were hatched. Unfortunately, one of the parent birds, being mistaken for a quail, was shot by one of his companions and the young birds died. From his description of the bird and its habits and his immediate recognition of it from the figure, there appears to be little doubt as to its occurrence in that locality. Its confirmation would be interesting.—J. A. Kershaw

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PROCEEDINGS

The monthly meeting of the Club was held on Monday, March 8, 1943. Owing to the absence through illness of the President, Mr. H. C. E. Stewart, Vice-President, presided over an attendance of about 80 members and friends.

PREHISTORIC ANIMALS

In the absence of Mr. A. S. Le Souef, who was to have lectured, an address on "Prehistoric Animals of Australia" was given by Mr. F. S. Colliver. Lantern slides and photographs of some of the larger forms of Australian vertebrate fossil forms were shown and a commentary given by the lecturer. Several questions were asked and some discussion undertaken, at the close of which the thanks of the Club were accorded to Mr. Colliver for his interesting talk.

REPORTS OF EXCURSIONS

Reports of excursions were given as follows: Domain, Mr. C. H. Shewan; Blackburn, Mr. A. S. Chalk; Yarra River trip, Mr. H. P. Dickins.

ELECTION OF MEMBERS

The following were duly elected:—As Ordinary Members: Mrs. Blanche Dallas Scott, Mrs. Florence R. Vasey, Miss Diana Scott, Messrs. J. L. Warlow, F. G. Elford, and Lance Le Souef; as Country Members: Miss M. V. Walker and Mr. Edwin Rich; as Associate Members: Miss Elsbeth Newman and Miss Dawn Weston.

QUESTIONS BY MEMBERS

Mr. J. A. Kershaw asked if it was a common thing for Lyrebirds to sing in February. Ans.: Several members reported that this was of fairly frequent occurrence.

NATURE NOTES

Mr. J. A. Kershaw reported on the visit of two unusual butterflies (*Danais crippus* and *Terias smilax*) to his garden at Windsor, and also stated that a sparrow-hawk twice struck against the wire of his canary cage whilst he was standing within a couple of feet of the cage.

Mr. V. H. Miller reported on a Wattle-bird eating lilly-pilly berries.

Mr. Noel Lothian commented on the appearance of the plant "London Rocket" in bomb craters in the heart of London. (See March *Vic. Nat.*)

EXHIBITS

Mr. C. J. Gabriel—Marine shells, *Ephippodonta macdougalli* and *E. lunata,* from South Australia

Mr. C. French—Flowering specimens of *Physianthus albens* (kapok creeper, codling moth or cruel plant), the flowers of which catch various butterflies, moths and other insects.

Mr. A. H. Steinfort—Collection of rocks from the Bacchus Marsh district.

Mr. H. P. Dickins—Seven watercolour studies of Australian plants.

PREHISTORIC ANIMALS OF AUSTRALIA

By F. S. COLLIVER, Melbourne.

(Summary of lecture given to the F.N.C., March 3, 1943.)

As in every other country, the existing fauna of Australia had its pre-history, and the following are notes on some of the better known forms.

In Recent to Pleistocene times an ancestral Platypus (*Ornithorhynchus agilis,* De Vis), an Echidna (*E. owenii,* Krefft) and a Koala (*Koalemus ingens,* De Vis) occurred in Queensland, and a Platypus (*O. maximus,* Dun) and Echidna (*E. robusta,* Dun) occurred in N.S.W. The Platypus and Echidna were approximately the same size as the living forms, but the ancestral Koala was a masive animal which, acording to De Vis, weighed upwards of 5 cwt.

More widely dispersed gigantic prehistoric Wombats and Kangaroos also were a feature of the Australian landscape of that time. A wombat as large as a hippopotamus (*Diprotodon australis,* Owen) is known from Queensland to Central Australia and was very common around Melbourne, and large kangaroos (*Procoptodon goliah,* Owen sp.; and others) upwards of 12 ft. tall had a more or less similar habitat.

Lake Callabonna, South Australia, was apparently the most recent habitat of the Diprotodon. Many an animal was mired and lost its life in the great swamp, which preserved the skeletons so complete in some cases that the complex bones of the feet were found in their correct position.

The reason for extinction of these gigantic forms was probably a failing food supply. Smaller types allied to existing forms evolved and survived where the large forms starved.

Remains of the living Dingo (*Canis dingo*, Blumenbach) are found in many parts, and are occasionally mixed up with the remains of undoubted prehistoric forms, e.g., the Wellington Cave deposits, N.S.W. It seems possible that the last of some of the prehistoric types were still living when the ancestors of our native race arrived with their dogs in Australia.

Probably the most interesting of all the Pleistocene marsupials was the Marsupial Lion (*Thylacoleo carnifex*, Owen), whose remains have been found in cave deposits of W.A., Vic., Qld., and N.S.W. Our knowledge of this animal is very incomplete. The skull indicates an animal approximating the lion in size, but the teeth offer a puzzle to the zoologist. The last pre-molar in both jaws is an enormous chisel-edged tooth over 2½ in. in length, and it is these teeth that are suspected of producing the incised bones occasionally found in possible association with remains of *Thylacoleo*. Other workers have suggested that these teeth do not restrict the animal to a meat diet, and list fruits and roots as a possible food also, pointing out that the fox for example has been known to make large meals of fruit.

Remains of the living Tasmanian Devil (*Sarcophilus ursinus*, Harris) and Tasmanian Tiger, sometimes called the Tasmanian Wolf (*Thylacinus cynocephalus*, Harris sp.) occur in many cave deposits on the mainland, and of this latter genus an extinct species (*T. major*, Owen) is recorded from Queensland.

Among the reptiles, a large lizard (*Megalania prisca*, Owen) upwards of 20 ft. in length is known from Queensland. Such a predator would certainly help to keep the increasing number of marsupials within bounds, and it has been suggested that the paucity of human remains in these deposits may also be due to the habits of this animal.

An ancestral crocodile (*Pallimnarchus pollens*, De Vis) with a very massive jaw occurs in Queensland, as well as remains of the existing crocodile (*Crocodile porosus*, Schneider), and it is of particular interest to note that this first-mentioned form has been recorded from Clunes, and the latter from the Loddon Valley, two Victorian localities.

An interesting Horned Turtle (*Miolania oweni*, A. S. Woodward) occurs in the Pleistocene of Queensland and New South Wales, and other species occur at Lord Howe Island, Walpole Island and Patagonia.

Passing now to the Mesozoic Period, we find representatives of the Marine Lizards (*Ichthyosaurus* and *Plesiosaurus*) occurring in the Cretaceous of Queensland, and a peculiarly Australian form of the Fish-Lizard (*Kronosaurus queenslandicus*, Longman) also occurs in deposits of this age at Hughenden. This animal, by the way, is represented in Australian museums only by fragments, and yet an American museum has a complete skeleton.

Australia has several representatives of the great Dinosaur group, and of these may be mentioned *Rhoetosaurus brownei*, Longman, a gigantic animal possibly 20 ft. high. Remains collected near Roma, Queensland, consist of numerous vertebrae, limb bones, etc.; unfortunately the skull is not known. Victoria had a large carnivorous Dinosaur which is represented by a claw bone from Cape Patterson: this animal was possibly allied to the well known *Megalosaurus* of the European Mesozoic period.

One animal possibly of Tertiary age, *Euryzygoma dunense*, De Vis sp., is unique as being the only one known having a skull width greater than the length. Remains of this animal were found some 70 feet down when a well was sunk at Brigalow, Darling Downs, Queensland, and we owe much to the Director of the Queensland Museum, Mr. Heber Longman, for his masterly work in the elucidation of the pile of fragmentary bones found. The animal had a large extension of bony material from the region of the cheek, and it is supposed that these extensions were the basis of very large cheek-pouches.

Going further back into the Mesozoic, the Triassic beds of the Sydney district have yielded a huge skeleton of an Amphibian, possibly a Labyrinthodont. The remains as collected were said to weigh two tons.

To mention just one fish whose history is gradually being unfolded. The Lung Fish, now living in the waters of certain Queensland rivers, is represented by a perfect fish (*Ceratodus formosus*, Woodward) from the Triassic of Brookvale, Sydney; by a scale (*C.* ? *avus*, Woodward) from a bore core at Kirrak, Gippsland, and by teeth (*C.* ? *avus*, Woodward) from Cape Patterson, both localities being of Jurassic age. Remains of the living species (*C. fosteri*, Krefft) are also recorded from the Pleistocene to Recent deposits of Queensland.

Australia has fossil remains of many large and interesting forms of animals, and it should be a national obligation that these be collected, properly preserved, and made available to students for study. The magnificent displays that are a feature of overseas institutions show what can be done in this matter, and in many cases these displays include material from Australia very much better than that in our own museums.

This state of affairs is a disgrace to science in Australia, and we hope for a more enlightened policy in the future.

THE BLUE ALPINE SUN-ORCHID
Thelymitra cyanea (Lindl.) Bentham

(With references to the allied *Th. venosa*, R.Br.)

By W. H. NICHOLLS, Melbourne.

The discovery on the Australian mainland of *Thelymitra cyanea* is of great interest to orchidologists, because some uncertainty has undoubtedly existed in the past relative to the differentiating characters separating it from the widely distributed, thus better known and closely related (yet distinct), *Th. venosa*, R. Brown, despite the fact that Lindley faithfully describes both forms (under *Macdonaldia cyanea* and *Macdonaldia venosa* respectively) in his work on orchids, which is in Latin.(1)

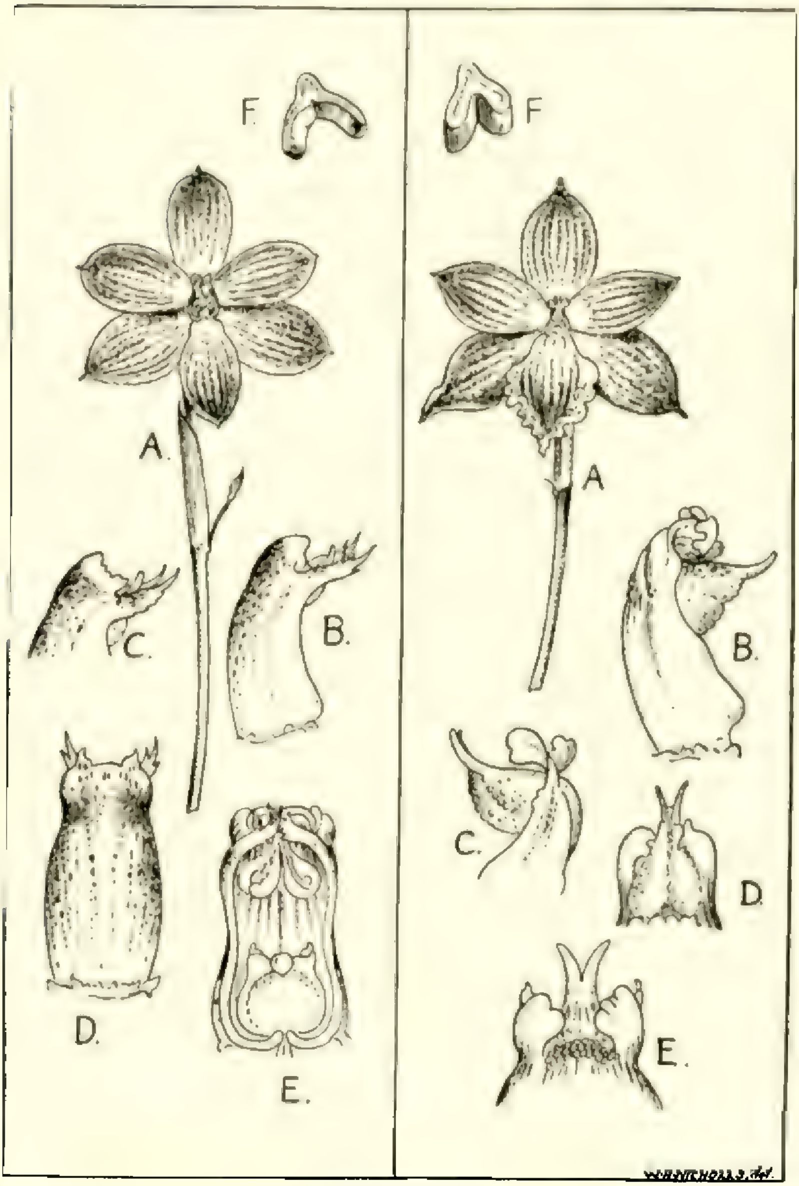
Up to the present time this *Thelymitra* species has been recorded only from Tasmania. Rodway, in *Botanical Notes*(2) also outlines the main distinguishing features of both *Th. venosa* and *Th. cyanea*, but his line drawings of the column are not altogether satisfactory on account of their small size. These figures (Nos. 21-22) represent the only drawings illustrating *Th. cyanea* yet published. Rodway refers to *Th. cyanea* as an "intermediate" between *Th. ixioides*, Sw., and *Th. venosa*. In the *Tasmanian Flora* (1903), p. 189, this botanist briefly describes *Th. cyanea*, including a character which is rightly embodied in descriptions of *Th. venosa*(3) as a salient characteristic, e.g., the bifid anther point. His description of *Th. venosa*, by the way, is very brief; here the anther is given as "much protruding," with no reference to its form.

Bentham(4) describes a robust form of *Th. venosa* as Robert Brown's type; apparently this is Rupp's variety *magnifica*(5) (?) And his description under *Th. cyanea* seems to embody the characteristics of both the typical form of *Th. venosa* and *Th. cyanea*. This view is apparent from a perusal of the description, also from the fact that he (Bentham) refers to Hooker's (fil.) plate of *Th. venosa*, R.Br., in the *Flora Tasmanica*(6) as representing *Th. cyanea*. This plate, however, is a very good presentation of Brown's *Th. venosa*.

Th. cyanea was discovered in eastern Victoria by Mr. W. Hunter on January 2nd, 1943. This is a new record—the initial find on the mainland.

Mr. Hunter writes, from his survey camp headquarters at Bendoc (via Orbost):

> It (*Th. cyanea*) invariably occurs with *Th. venosa*. I have not yet been able to find it in the places which *Th. venosa* seems to favour the most—the sphagnum moss beds of the swampy flats. I have found it only amongst or close to the belts of heath (*Epacris microphylla*) and low heath-myrtle



KEY TO PLATE

Thelymitra cyanea, Lindl.

A—Flower. B—Column from side. C—Head of a column, from side. D—Column from rear. E—Column from front. F—Cross-section of leaf.

Thelymitra venosa, R.Br.

A—Flower. B—Column from side. C—Head of a column from side. D—Head of a column from front, showing bifid anther. E—Head of a column from rear, showing bifid anther. F—Cross-section of leaf.

(Figures A in both instances about natural size.)

(*Baeckea Gunniana*) that fringe the wetter parts of the flats or are dotted amongst them where the soil is comparatively drier and not at all swampy; and then only where *Th. venosa* occurs in numbers. My specimens of this *Thelymitra* (*Th. cyanea*) (13) are quite uniform in all their main characters, while all the *Th. venosa* have yellow spirally-involute appendages to the column and the long bifid point to the anther. There is no evidence of any close relationship between the two species, in spite of their similarity in general external appearance and their occurrence together.

Description of the Bendoc specimens of *Th. cyanea*: A very slender plant 23-61 cm. high. Leaf-lamina narrow, deeply channelled, shorter than the stem, but thinner at the margins than in *Th. venosa*. Stem-bracts usually 2, closely sheathing, subulate. Flowers 1-4 (usually 2), the slender pedicel often concealed by the floral bract; blue, faintly veined in a darker shade; perianth-segments varying in length from 10-16 mm. Sepals lanceolate; dorsal sepal broader than the lateral ones, and cucullate. Petals slightly broader (up to 8 mm.); lateral petals nearly ovate; the labellum more nearly obovate or broadly oblanceolate. Column mostly of the bluish colour of the flower, about 6 mm. long and 4 mm. broad, widely winged and tri-lobed; the broad intermediate lobe produced upwards behind the anther and slightly hooded; mid-lobe darker coloured, except for the narrow yellow upper margin, which is more or less inturned and usually irregularly and faintly sinuate; lateral lobes horizontal at the height of the anther and about as long as it, or slightly longer, irregularly toothed or jagged at the end. Anther horizontal, with a short horizontal apical point, but almost completely concealed by the lateral lobes of the column, unless viewed from directly above the flower. Stigmatic plate conspicuous in the lower cavity of the column, a small boss in the centre adjoining the disk.

Flowering December-January. Habitat: Bidwell Creek, about two miles above its junction with the Delegete River (Bendoc district, about 3,000 ft. elevation).

Sometimes the flowers of *Th. cyanea* are white.

Synonymy: *Macdonaldia cyanea* = Lindley in *Bot. Reg.*, App. No. 222; "Gen. and Sp. Orch.," 386 (1830-1840); *Thelymitra cyanea* = (Lindl. M.S.) = Bentham in *Flora Aust'sis*, vi., 323 (1873).

Distribution of *Th. cyanea* (Lindl.) Benth.: Tasmania, Victoria.

REFERENCES

(1) *Bot. Reg.*, App. No. 222; *Gen. et Sp. Orch.*, 386.
(2) *Roy. Soc. Tas.*, 184, t. 3, figs. 21-22.
(3) See *Fl. S. Aust.* (Orch. by R. S. Rogers), p. 122
(4) *Fl. Aust'sis*, vi., 323.
(5) *Aust. Orch.*, Rev., Vol. 4, Pt. 3, Sept., 1942, p. 81.
(6) ii, 4, t. 102a.

FURTHER NOTES ON BIRDS OF A MELBOURNE PARK

By A. H. CHISHOLM

Various interesting developments, some of them puzzling when set against others of a year previously, occurred during the past spring and summer amongst the birds of Wattle Park. For example, although the season generally appeared to be as favourable as that of its immediate predecessor, certain birds present in 1941 did not appear in 1942; and, on the other hand, certain birds not seen in '41 visited the area in '42.

When discussing at the end of last winter (*Vic. Nat.*, Sept., 1942) the birds of this suburban area—or, rather, the eastern section of the area—I suggested that nesting in the reservation during the forthcoming spring would be severely hampered by the fact that a military camp had sprung up among the gum-trees and wattles. That prediction was not fulfilled. In fact, only three species of birds recorded in the area in '41 failed to appear in the spring of '42, and it cannot be said definitely that the human factor was responsible for the absence of the birds in any of the three cases. On the other hand, three species not previously recorded were noted in the area in '42, and two additions were made to the record of nesting species.

Thus the list of native birds for the eastern portion of the Park (an area about 600 yards long by 300 yards wide) now contains 42 species, and the number known to breed in the area, in two seasons, is 21 species. It is a very healthy record for a restricted portion of a Melbourne park, and one carrying no undergrowth and very little water.

In all, I found during the spring of '42 some 35 nests, belonging to 12 native species, in the area. None of these was seen before mid-September, for, curiously, although conditions seemed favourable enough, the breeding season generally appeared to be about a month behind that of '41. At that stage I had begun to think that the numerous tents and the movements of men had hampered the birds, but was pleasantly surprised late in October (I was away in the first half of that month) to find that several species were using the camp for their own benefit. That is to say, they were filching fibre from ropes for nesting purposes and were feeding on scraps fairly in front of the tents. And the men, on their part, were enjoying the presence of the birds, not only (so one of the trainees told me) for their grace and beauty, but because of the airy music that heralded the dawn of each day. In short, a pleasant partnership had been developed, and it continued to flourish during the whole of spring and summer. Indeed, when the camp was removed from the area (at the end of March) some of the birds seemed to be rather disappointed!

Of the three species that frequented the area in the spring of '41 and failed to do so in '42, one, the Scarlet Robin, was apparently frightened away. Two nests of this bird had been found in '41 in a spot that became in August last a centre of human activity, whereupon the birds disappeared, presumably to breed in a quieter area. They were not seen in the Park during spring and summer, but two pairs were noted there again on March 14, 1943. The other two "failures" were the Masked Wood-Swallow (an erratic migrant that visited the Park in '41 but did not breed there) and the Oriole, a pair of which nested in an unusually low situation in '41 but did not appear at all in '42.

Two other species which deserted the area last spring had done so also in the previous spring. These were the Grey Fantail and the Golden Whistler. I saw Whistlers (a radiant male and two uncoloured birds) in the area as late as September 20 and Grey Fantails as late as September 29, at which stage I had hopes that they would stay to breed. Both species, however, had vanished when the Park was next visited (mid-October) and were not seen again until March of '43. Incidentally, whereas previously I had seen the Rufous Whistler (a female) in the area only in August, in November of '42 I saw a pair of the birds singing above the tents. Apparently, however, they did not breed in the Park.

Here follow notes on some of the birds observed in the eastern portion of the area in the spring-summer of '42:

Crested Shrike-tit.—One or two pairs of this pretty species appear to frequent the Park throughout the year, and nests have been seen in three successive seasons. In '41 a nest with eggs was found as early as September 1 (which means that building began about mid-August), but last spring it was not until September 26 that the birds were seen at work, and then they were only commencing to build. The female was the chief worker; the male merely flew around or sat by and piped lustily. A second nest, situated about 100 yards from the first one, was found on November 14. Both were placed at a height of about 25 ft. in the tips of trees. Mr. D. Dickison and I cut the nests down late in January (this year) and found the September example to be somewhat weather-beaten and the November one in good condition. As is usual, both revealed the splendid artistry of the Shrike-tits (it is astonishing how these birds with the hooked beaks can weave such neat and symmetrical nests), and in each case branchlets had been nipped off above the cradle. This practice may be prompted by a desire for more sunlight, but I rather think it is designed to lessen the swaying of the nest. The considerable depth of the little cup is another precaution to safeguard the eggs in such breezy situations.

Rufous Song-lark.—As stated in my article of September last, several pairs of Rufous Song-larks frequented the area in the spring of '41 (they were first noted in mid-September) and three nests were found in October-November. With a lush growth of grass obtaining again in '42, it was reasonable to expect the wandering larks to reappear, but this time the resonant and persistent voice was conspicuous by its absence up to as late as November 14. Then, to my astonishment, a single Song-lark appeared and sang its way, somewhat apologetically, about the Park. A week later that bird had disappeared and no other sight or sound of a Song-lark has since been gained. Why did that solitary wanderer appear so late? Why did it vanish so soon? Where did it go?

Wood-swallows.—The movements of migratory Wood-swallows are always capricious and puzzling. In '41 some fifty White-brows and about twenty of the beautiful Masked species appeared in the Park in mid-October, and a few days later most of the White-brows and all of the Masked birds disappeared. A week later the area was again favoured by the presence of about twenty White-brows, all of which nested there. In '42 no Masked Wood-swallows appeared at all (although they were fairly abundant up in Central Victoria), and White-brows were not seen until October 31—they were not there five days previously. In contrast to the delay in breeding during the previous spring, this time they commenced throwing their flimsy nests together at once. But, somehow, the hearts of the pretty wanderers (there were five or six pairs present) did not appear to be really concentrated on family-raising—they made less noise than usual and in general had an air of detachment. Eggs were laid in at least some of the nests but all were deserted later, and early in December all of the birds disappeared.

In contrast with the erratic nature of its relatives, the Dusky Wood-swallow remains more or less constant to the Park during the year and several pairs breed there. These dapper little birds are remarkable acrobats. In November last I saw one fly to a tree, turn upside down on the wing, and cling to a branchlet while in that position.

White-winged Triller.—In my notes of September last I remarked that I had not seen the White-winged Triller (*Lalage*) in the Park. That lack was remedied on October 25, when I heard the familiar prattling chatter and followed a spick-and-span male bird to a nest, nearly completed, some 12 ft. up in a wattle tree beside the eastern fence. A week later there were three pretty eggs—green, with brown spots—filling the tiny nest. Moreover, to my surprise three more pairs of Trillers were now seen nesting near by, one in a wattle and the others in gums. All four nests were within a radius of 50 yards, and all were hard by a number of tents.

Each of the male Lalages was very vocal and very tame. One gathered fibre from ropes supporting a tent. Another sat on a dry branch above a tent and gave a pretty display with expanded wings and tail, its well-tailored suit of black and white glowing in the sun. The quieter-coloured females were much more subdued. These birds, indeed, are precisely the opposite of their mates in temperament. Has anyone ever heard a suggestion of song from a lady Lalage—anything more than a faint charring note when disturbed at the nest?

On November 7 the male Trillers—always thoroughly attentive and assertive—were sitting on three eggs in each of the two wattle-tree nests, but the other two nests begun in gum-trees had been abandoned in favour of new sites a short distance away. One of these was on a horizontal branch, at a height of about 10 ft., fairly in front of a tent; the other was some 25 ft. aloft in a ragged gum. By the end of November all four nests contained young, and at this stage the volatile male birds, being busy feeding their offspring, were much less vocal.

When I next visited the area, on December 12, not one of the Trillers was to be seen. Why did they leave so suddenly? Where did they go? How did the immature birds contrive to travel? I cannot answer these questions. The Trillers, like their fellow-migrants the Wood-swallows and Song-larks, are capricious birds, and you never know when or why they will appear or disappear.

Possibly the movement was governed by food supplies. Early in October a heavy irruption of caterpillars of the cup-moth developed in the area. Most of the gum-trees were largely decimated and the spot generally presented an appearance akin to that caused by a bush-fire. Presumably news of this development reached the Trillers (which used to be known as Caterpillar-eaters) and caused them not only to breed in the Park, but to do so in a group, without any suggestion of friction. As far as could be seen, the birds subsisted largely on these noxious, highly-coloured caterpillars, being quite untroubled by the "stings" on the insects' backs that have caused pain to many a human hand. At any rate, I frequently saw a Triller fly to the tips of leaves, seize a caterpillar, thrash it against a branch, and swallow it. Within six or eight weeks, however, the work of the Trillers and the Cuckoo-shrikes seemed to have practically exhausted the supply of caterpillars. By this time too the trees had made a remarkable recovery—before mid-December all were practically "full-fledged" again. Nevertheless, this does not seem to explain sufficiently why the Trillers should depart so suddenly (leaving the Cuckoo-shrikes in charge) at a time when their young ones were scarcely fit to travel.

On the whole, this visitation by the handsome and sunny-voiced Trillers, all nesting harmoniously within a small radius, was a very agreeable circumstance—agreeable alike to naturalist-visitors and to soldiers who watched and listened to the birds at intervals of each day. Incidentally, the presence of the Lalages brought the number of black-and-white birds in the area to four, the others being the Magpie, Mud-lark and Wagtail.

Cuckoo-shrike.—A suggestion made in my previous article that the Blue Jay (Black-faced Cuckoo-shrike) would be found to breed in the Park was abundantly borne out last spring. Possibly the presence of the cup-moth caterpillars was a stimulating factor. At any rate, whereas in the spring of '41 I could not discover any nests of this species, this time there was no special difficulty in finding three. All were situated from 25 to 30 ft. up sturdy gums, and in each instance the nest was the usual sturdy saucer of fibre. One of the nests (found in October) was more noticeable than is customary because the tree was almost completely defoliated by caterpillars. Apparently the birds fed largely on these insects; they were frequently seen flying at the tips of leaves and then beating the catch on a branch.

More sedentary than their relatives the Trillers, the Cuckoo-shrikes sometimes "stick around" in autumn and winter. On March 14 last I saw several of them frisking among the tents in company with Magpies and Mud-larks.

Other Species.—Aside from the Triller, the species recorded as "new" to the Park are the Brown Quail and the Narrow-billed Bronze Cuckoo. I flushed a single Quail on October 13 and heard the Cuckoo there on the same day. Three species of Cuckoos (including the Pallid and Fantailed) are now recorded for the area. Other birds seen in the reservation during last spring were more or less common species, as discussed in the previous paper.

Any members having early copies of excursion lists, conversazione tickets, notices of meetings, etc., are invited to present them to the Club, so that the series of such items kept as a record of Club activities may be made more complete. Such items should be handed to the Hon. Secretary.

GEOLOGICAL RECONNAISSANCE IN THE QUARTZITE RANGES, NEW GUINEA

By Maurice F. Leask, A.I.F., Somewhere in Australia

For some time I had the opportunity of examining the geological features of portions of the Central Division (Papua), part of which is in the "dry belt." In surface topography these ranges take the form of fairly abrupt but convex-sided ridges running in parallel rows on approximately north-south lines. The crests are a series of roundly serrated peaks.

Closer inspection reveals that the summits consist of almost half grassy soil and half loose or projecting stones. This is, then, the residual arising from an annual rainfall yielding an average of 33 inches to 40 inches in the months of November to March; the yield of ten inches per month at the end of the rainy season may be expected to produce more serious erosion.

Over the whole area, including the summits, the vegetation consists of eucalypt bush ranging to fifty feet in height; two species are present: a white gum with silvery, rounded foliage resembling young blue gum, and a gum with narrower, more elongated leaves slightly darker in colour. The undergrowth is made up of dwarf tree-ferns, indigofera and (at least in pre-war days) a dense growth of kangaroo-grass.

For determination, specimens were taken from an excavation. No. 1 Hole, near the top of a range east of Port Moresby. (Restrictions prevent a more precise direction.) Here the topsoil is black for a depth of four or five inches; in places, according to the lack of moisture, it is grey and brown.[1] This soil weathers to the black dust so familiar to transport drivers.

The subsoil is brown; in its lower levels it is reddish, containing angular gravel, with fragments of weathered quartzite, especially at the greater depths, where the colour is more consistently reddish brown. This results in the persistent red coloration over any widespread excavations. One side of the hole showed subsoil extending for 36 inches; on the other side it extended for 48 inches.

In the lowest levels, from 36 and 48 inches downwards was a crumbly, friable clay, greenish to bluish[2] in colour, containing larger boulders of quartzite, one measuring 30 inches by 22 inches and another 31 inches by 26 inches.

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[1] "Along the southern littoral alone there are millions of acres of rich plantation soil." (Report of Agriculture, 1906-07; Papua.)

[2] "Pieces chipped from this (an ironstone lode) almost anywhere are stained with the green leachings of copper." (Report on Mines, 1906-07; Papua.)

The following specimens have been identified:

1. A buff to grey-coloured siliceous rock of uneven fracture, intermediate in physical properties between chert and fine-grained quartzite, the latter being perhaps the name best applied.

2. Generally similar to the above specimen, but having a more even, flat fracture, finer texture, a greater degree of translucency, and being in consequence more nearly akin to chert.

3. An opaque, smooth-textured, yellow-brown concretion of resinous lustre, best described as opal-jasper, with numerous thin, somewhat irregular, but roughly radiating veins of bluish-coloured chalcedony. These concretions weather out at the surface as boulders traversed by light blue streaks.

4. A siliceous breccia consisting mainly of jasper and opal-jasper, with blue-grey to pale violet coloured veins of chalcedony; distinguished from the specimen last described by the brecciation which, in the field, causes these somewhat brittle rocks to crumble into a pile of fragments resembling road metal.

5. A brownish to pink-coloured siliceous rock containing small, irregular patches of an indeterminate green mineral similar in general characters to prase and, in part, to chrysoprase. In view of the presence of copper ores in the area, and the unexpected hardness of this mineral, it was thought to be perhaps the hydrous copper silicate—"chrysocolla." It failed to respond to the chemical tests for this species, however, and even after fusion with sodium carbonate showed no trace of copper. Copper has been mined at Tupuselei Head, and close to the Laloki River nine miles to the north of the last-named locality.

6. Grey to blue-grey chalcedony.

7. Reddish, earthy, siliceous rock exhibiting a white, polished and striated, enamelled face, which is quite clearly a "slickensided" surface produced by friction between the opposite faces of a fault or shear plane caused to slide one over the other during earth movements.

The determinations listed agree well with the description (in the Annual Report, Papua, year ending June 30, 1907), compiled by Mr. Gibb Maitland:

Port Moresby Beds. Greenish sandy shales, limestones, Calcareo-siliceous beds, with chalcedony and nodules of flint in the vicinity of Port Moresby. These extend along the coast from Hall Sound to McFarlane's Harbour, longitude 148·10 east, running inland for a considerable distance in the vicinity of the Kemp Welsh River.

THE NAME FITZGERALD

Members who have noted the recent difference of opinion re the spelling of the name FITZGERALD may be interested to turn up the obituary notice in the *Victorian Naturalist*, Vol. IX, p. 75 where the small g is used six times. The editor at that period was Mr. A. H. S. Lucas. In the annual report immediately following, the new editor, Mr. F. G. A. Barnard, also spelled the name with a small g. As both of these editors were particularly careful and painstaking, it would appear that the capital G was not used at that time. The earlier lists of members' names are not helpful, as all Honorary Members had their names printed in capitals.—BLANCHE E. MILLER.

DELETIONS FROM THE VICTORIAN FLORA

By JAMES H. WILLIS, National Herbarium, Melbourne

Following immediately on the mail delivery of our March *Naturalist*, I received a telephone call from Mr. A. S. Kenyon, asking why I had deleted Wilga (*Geijera parviflora*) from the Victorian Plant Census. In response to my explanation that there was no existing herbarium specimen from this State and that the plant had not been observed by recent workers in the far north-west, Mr. Kenyon hastened to assure me that he had seen *Geijera* growing spontaneously this side of the Murray River and could take me to an area of several square miles near Narrung (between Piangil and Euston) whereover the Wilga still flourishes.

This valuable record impels me to thank Mr. Kenyon and to reinstate the species on our lists; it must be considered as a rare plant in Victoria, and Narrung may well have been the very locality ("Murray Desert") from which Mueller collected it on his memorable journey up the Murray in 1854.

Residents of the Mallee between Annuello and the river might perhaps locate other patches of *Geijera parviflora*, also of *Hibiscus Farragei* and *Bossiaea Walkeri*, shrubs which are confined in the State to this interesting but little known belt of country. The National Herbarium would welcome good specimens of these, and particularly of Wilga, to substantiate for all time its occurrence with us.

Here follow five more species which for various reasons should now be omitted from the Census:

1. *ANDROPOGON AFFINIS*, R.Br. The record is apparently based on a solitary specimen collected in the north-east by C. Walter, but this is without doubt an unpitted representative of *Bothriochloa decipiens* (Domin) Hubb. (syn. *Andropogon pertusus* Willd.), and we have no authentic record of *affinis* from nearer than the Blue Mountains.
2. *DANTHONIA PAUCIFLORA*, R.Br. This is a very small and distinctive grass confined to the high mountains of southern Tasmania. What has masqueraded under the name in Victoria was given specific rank as *D. nudiflora* by P. F. Morris (1935 *Vic. Nat.*), but he did not make it clear that the new species must *replace D. pauciflora* as listed for the State by Bentham, Ewart, and others.
3. *KOCHIA CILIATA*, F.v.M. All specimens so designated at the National Herbarium are referable to the related species *K. pentagona*, R. H. Anderson. The true *ciliata* occurs along the Darling River and may yet be found within the N.W. boundary of our State, but until someone actually finds it there, we would do well to leave it out of our Census.
4. *CALLISTEMON SALIGNUS*, (Sm.) D.C. Despite Ewart's remark, "widely spread in Victoria" (*Fl. of Vic.*, 1930), no herbarium material can be produced from nearer than Port Jackson. His description of the species is practically a repetition of that given immediately before for *C. paludosus*, F.v.M., and the localities Ewart quotes are precisely those which are cited for the latter species by Bentham (under the name "var. *australis*," p. 121, *Fl. Aust.*, vol. 3). The examples of Victorian "*salignus*" housed in the Melbourne Herbarium all sort up into either *C. paludosus* or *C. pallidus*.
5. *BRACHYCOME TADGELLII*, Tovey and Morris. The type is indistinguishable from that of *B. cardiocarpa*, F.v.M., var. *alpina* Benth., and Mr. P. F. Morris now admits that his description of the *Tadgellii* achenes must have been made from immature flower heads. This is probably the commonest daisy of our snowfields and is plentiful on Lake Mountain, near Marysville.

NOTES ON THE LARGE GARDEN SPIDER

For the past seven weeks we have had under observation a female of the common Large Garden Spider (*Ercira productus*). This spider is nocturnal in its habits, and we have found much interest in watching the building of the web.

She has a single thread stretched across the yard from the garage to the wash-house; that is, a single line extending a span of 30 feet and 8 feet up from the ground. At about 8 o'clock each night, hanging upside down, she walks out along the thread. Occasionally she inspects the whole 30 feet of line, but usually contents herself with a journey of 6 or 7 feet from the garage. Here she will rest motionless for half an hour or more, then commence weaving a circular web.

The web takes between two and three hours to complete and sometimes is extremely large. By measurement it was found to be 2 feet in diameter and by count was found to contain 19 radial threads and 115 circles. In addition the web is anchored by several vertical threads dropped to the ground. Sometimes there is a small stone hanging to one of these as a weight; one such stone which we measured is a half, by a quarter, by an eighth of an inch; it was suspended about two inches from the ground. The circular web is completely gone by morning, supposedly either cut away or consumed by the spider herself. On two occasions it has been left intact to remain all day till evening, but each time was accidentally broken.

During the period of the night (up till 11.30) she has been under observation, the spider got very little prey. Once or twice some small moths were "netted." The spider left her position in the centre and ran down to the victim; she spun some web around it and then, clasping it in her legs, she swung out from the web and climbed back to the centre by a separate line she had carried down with her. This has been her method when the victim is below her. I have not seen her in action when the catch is above the centre of the web.

The web used to be placed about five feet from the ground, but in the last few days the spider has taken to spinning a smaller circle about one foot in diameter and placing it much higher.

E. S. Hanks.

GROUND PARROT OR NIGHT PARROT?

A note in the *Vic. Nat.* for March, written by Mr. J. A. Kershaw, referred to "the Ground Parrot (*Geopsittacus occidentalis*)" having been seen on a salt-bush plain west of the Lachlan (N.S.W.). It should be noted, however, that the term Ground Parrot belongs to *Pezoporus wallicus* (sometimes called the Swamp Parrot) and that *G. occidentalis* is the Night Parrot, a very rare species that has not been reported for many years and about which little is known. The locality mentioned, together with the reference to a nest in porcupine grass, suggests the Night Parrot.—A.H.C.

BIRDS KNOTTING GRASS

A bushman at Donald says that while shooting at Lake Bulloak the boat was brought up sharp by two bunches of grass tied securely enough to hold it. On looking about he saw the same thing everywhere, the rushes all tied together. On watching for the cause he came to the conclusion that the red-headed bald coot must have fastened them together as a sort of perch. They appear to get two lots of this wiry water grass about 1 ft. apart, and fasten them securely enough to form a perch or platform for themselves.

MEISSNER OR MEISNER?

In Baron von Mueller's *Second Systematic Census of Australian Plants* (1889) are recorded the following West Australian species: *Acacia Meissneri* Lehm., *Adenanthos Meissneri* Lehm., *Banksia Meissneri* Lehm., *Hakea Meissneriana* Kippist; also *Cryptocarya Meissneri*, F.v.M., from Queensland, each obviously commemorating one and the same person. Yet, strangely enough, our accessible thesauri of botanical literature make no mention of any botanist named Meissner. Ample reference, however, is made to works of the celebrated Karl Friedrich MEISNER, one-time professor of botany at Basle University (Switzerland) and world authority on monochlamydeous plants, including our Australian *Proteaceæ* and *Thymelæaceæ*. Consultation of the type descriptions of the four West Australian plants cited above reveals that they *were* originally spelt with a single "s" and were certainly named in honour of Professor Meisner.

The incorrect spelling which appears in Mueller's Census was apparently initiated by George Bentham when describing *Acacia Meisneri* Lehm. (*Flora Australiensis*, Vol. 2, 1864, p. 354) and is perpetuated throughout his later treatment of the *Proteaceae*, not only in the specific names themselves but in citation of Meisner's name—indeed, Bentham seems to have been quite oblivious of the fact that Meisner spelt his name with a single "s" (as did his contemporary Lehmann in *Plantae Preissianae*).

When Mueller first used the name *Meisneri* in describing a new Queensland *Cryptocarya* (*Fragmenta*, V, 1866, p. 170), he, too, inserted an extra "s"—surprising enough in view of his own German background and intimate acquaintance with the published works of Meisner and Lehmann.

Both F. M. Bailey and C. A. Gardner have blindly followed Bentham in keeping up the erroneous double "s," but the case for a return to the true spelling of Karl Meisner's name is surely clear-cut and unassailable.

James H. Willis, National Herbarium of Victoria.

THE GOULDS IN AUSTRALIA

A footnote to Mr. F. Chapman's article on Charles Gould, in the March issue of the *Vic. Nat.*, gives the year of his death as 1895. This is a misprint for 1893. While on the subject of errors, it may be mentioned that in a letter from Lady Franklin to Mrs. Gould, published in this journal in October, 1938 (p. 99), the statement, "Mr. Price has not gone to the town" should have read "Mr. Price has not gone to the Huon." And in the issue for June, 1939 (p. 23, second line from top), the references to Mrs. Gould's stay in Hobart should read: "from her arrival on September 19, 1838, until August 20, 1839."—A.H.C.

"DOMESTIC" BOTANY

We sometimes think of botanists in the Early Victorian era as a stolid, musty, academic race who wrote their descriptions in dull Latin and gave us never a glimpse of the humanity behind the man. The following note from Tasmania (Feb., 1857), in Charles Stuart's small neat hand, is attached to his type collection of the little orchid *Prasophyllum intricatum* (now *P. Archeri*) and strikes quite a refreshing domestic chord: "*I am not certain if I have made an error here . . . I have to write in a house full of children*"!
—James H. Willis.